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General Survey Committee

Synopsis of the findings of the vocational education...

New York City

[1914]

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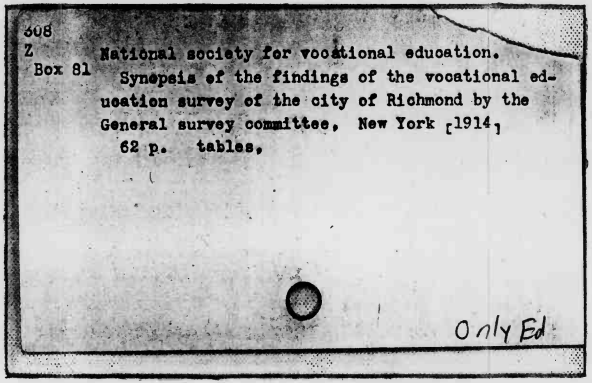
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NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION

SYNOPSIS of the FINDINGS of the VOCATIONAL EDUCATION SURVEY of the CITY of RICHMOND

BY THE

GENERAL SURVEY COMMITTEE

Published by the
National Society for the Promotion of Industrial Education
140 West 42d Street, New York City

National Society for the
Promotion of Industrial Education

It is announced with regret that the charts showing in detail **The Findings About the Trades** and **The Findings About Education for the Trades** which were to have accompanied this Synopsis are not ready for insertion. These Charts, will, however, be ready for distribution at the Convention of the National Society in Richmond, December 9th.

SECTION I

FOREWORD

This synopsis of the Report on Findings of the Survey gives a brief account of the organization and method of the Survey and of some of the most important information bearing on the problem of vocational education for Richmond.

It is issued in order that all those attending the Annual Convention of the National Society in Richmond (Dec. 9-12, 1914) may have an intelligent understanding of the work and of the tentative recommendations of the General Survey Committee which will be presented for discussion at that time. A later bulletin giving this Synopsis of Findings and the tentative recommendations of the General Survey Committee will be issued in advance of the Convention. The full text of the Findings and the final recommendations of the Committee will be published after the Convention by the United States Bureau of Labor Statistics.

The aims of the Survey on the part of the National Society were such as the following:—

1. *To prove the necessity of a knowledge of industrial and school conditions* in the making of a program for industrial education in a city.
2. *To show the kind of facts about industry and about the schools* which need to be gathered.
3. *To develop a proper method for studying the industries and the schools* for purposes of industrial education.
4. *To secure the co-operation* of national and local public and private agencies in the making of a type survey and to bring to bear upon the task the best expert service and advice that could be secured.
5. To make the annual convention of the Society more helpful to the convention city by focusing much of the discussion on its problem and leaving with it not only information as to conditions and possibilities, but also wide discussion and expert advice through the membership of the National Society and others as to the development of industrial education in the city.

The purposes of the Richmond authorities in having the National Society make the Survey were such as the following:—

1. *To make the Annual Convention in Richmond most helpful* to a city interested in providing practical education for its people.
2. *To give the city a knowledge of the industrial and school facts and conditions* which must be considered in developing a program of industrial education and the best expert advice as to what Richmond should do and how she should do it, in order that, as one Richmond school official expresses it, "Richmond may not be working in the dark."

Arrangements with the City of Richmond. Richmond has met the local expenses of the Annual Convention of the Society for 1914 and the cost of making the School and Industrial Surveys. The National Society has met the usual general convention expenses and in addition the expense of printing the bulletins of the Society bearing on the Survey, of its office force while engaged in the work of Survey, and of the General Survey Committee.

The General Survey Committee. The agreement between the Richmond authorities and the National Society provided for a General Survey Committee to have direct charge of the Survey and a Local Survey Committee made up of citizens of Richmond to co-operate. At the outset the General Survey Committee which directed the conduct of the Survey, consisted of the following:—Dr. Leonard P. Ayres, Director Russell Sage Foundation, Chairman; Mr. Charles H. Verrill, Chief Editor, U. S. Bureau of Labor Statistics; Mr. L. W. Hatch, Chief Statistician N. Y. Bureau of Labor; Dr. J. A. C. Chandler, Supt. of Schools, Richmond, Va.; Prof. C. R. Richards, Director of Cooper Union, New York; Mr. Chas. H. Winslow, Special Agent United States Bureau of Labor Statistics, and Mr. C. A. Prosser, Secretary of the National Society.

For the purpose of dealing with the "Recommendations of the Survey" there were added to the General Survey Committee the following persons:—Mrs. Mary Schenck Woolman, formerly Director Manhattan Trade School for Girls and Professor of Domestic Art, Teachers' College; Miss Laura Drake Gill, President College for Women, University of the South, Sewance, Tenn.; Dr. P. P. Claxton, U. S. Commissioner of Education; Prof. R. W. Selvidge, Peabody College, Nashville, Tenn.; Mr. Arthur D. Dean, Chief Division of Vocational Schools,

Albany, N. Y.; Mr. M. P. Shawkey, State Supt. of Free Schools, West Virginia; and Dr. Wm. M. Davidson, Supt. of Schools, Pittsburgh, Pa.

The Local Survey Committee consisted of the following:—Mr. Frank W. Duke, Chairman; Mr. James B. Doherty, Mr. John Hirschberg, Mr. W. T. Dabney, Mr. W. H. Owen, Mr. A. H. Hill, Mr. K. J. Hoke, Mr. J. G. Corley, Mr. L. H. Jenkins, Mr. J. D. Crump, Mr. Jno. Stuart Bryan, Mr. Alvin Smith, Mr. E. C. Pelouze, Mr. F. C. Ebel, Mr. H. F. Smith, Mr. R. B. Greenway, Mr. J. J. Creamer, Mr. Preston Belvin.

Director of the School Survey. Dr. Leonard P. Ayres, Director of the Division of Education of the Russell Sage Foundation, was secured as Director of the School Survey. He was assisted in this work by R. R. Lutz, Assistant Director, and the regular staff of the division.

Director of the Industrial Survey.—Mr. Charles H. Winslow, Expert on Industrial Education for the U. S. Bureau of Labor Statistics, was secured as Director of the Industrial Survey. He was assisted in this work by Dr. John Cummings, Statistician and Research Expert, formerly of the U. S. Census Bureau and later Research Expert with the U. S. Commission on National Aid to Vocational Education; Miss Cleo Murtland, Assistant Secretary for Women's Work of the National Society for the Promotion of Industrial Education; Dr. Wm. T. Bawden, Specialist in Vocational Education for the U. S. Bureau of Education; and an office and field force of workers.

Co-operating Agencies. The Society has been fortunate in securing the hearty co-operation of many helpful agencies in the work of the Survey. Perhaps its largest service has been that of bringing to bear upon the Richmond problem so much expert assistance from many different sources, much of which was given entirely without cost and whose value cannot be estimated in money. It would be impossible to acknowledge here all the aid which has been given in various ways.

Special acknowledgment, however, is due the following:—

The United States Bureau of Labor Statistics, which gave six months leave of absence to Mr. Chas. H. Winslow so that he might serve as Director of the Industrial Survey, is to issue the Full Report of the Findings and Recommendations of the Survey as one of its publications; and has, through Dr. Meeker, U. S. Commissioner of Labor Statistics, and Mr. Chas. H. Verrill, its chief editor, co-operated with the Survey by every legitimate means within its power.

The United States Bureau of Education, through its Commissioner, Dr. P. P. Claxton, has given wide publicity to the work of the Survey and the Convention.

The Russell Sage Foundation, which through its director of educational work, Dr. Leonard P. Ayres, conducted the School Survey and met a large part of its cost.

The Richmond School People who have from the outset given their earnest support and hearty co-operation to the work. Without their assistance the results achieved would have been impossible.

The Citizens of Richmond, who have aided in many ways. Special appreciation is due for the help given by the local survey committee, the local program committee, and the employers and workingmen who have made the Survey a success by their willingness to furnish all the information requested.

Type Classes. The findings of the Survey and the interest awakened in industrial education have made possible the organization of certain type classes in industrial education which will be in operation at the time of the convention. The organization of these classes will be under the general direction of Mr. C. H. Winslow, Miss Cleo Murtland, Dr. Wm. T. Bawden and Mr. Alvin E. Dodd.

SECTION II

FACTS ABOUT RICHMOND

Richmond, the Capital of Virginia, is situated in the eastern part of the State at the head of navigation of the James River.

Population Increasing Rapidly. The estimate of the U. S. Census for 1914 gives the city 134,917 inhabitants. Between 1900 and 1910 the increase in population was 50 per cent, more than one-fifth of the total increase for the State being in Richmond. In 1900 it was the forty-sixth city in size and in 1910 the thirty-ninth city. Only 9 of the 50 cities having a population in 1910 of 100,000 or more show a percentage increase for the previous ten years as high as that shown by Richmond.

Population Massed in a Relatively Small Area. Only six of the 47 large cities covered by the census data of 1910 regarding area and population reported a population per acre within city limits as great as that of Richmond, each of these six cities having more than 300,000 inhabitants. The annexation of large suburban areas since 1910 has brought within the city limits considerable sparsely settled territory, but has not reduced the density of the business and industrial sections. Richmond possesses a distinct advantage for industrial education over those cities whose industrial establishments are more widely scattered and necessarily more remote from any school center.

Richmond Is the Rapidly Growing Manufacturing Center of Virginia. In the ten years previous to 1909, the number of manufacturing establishments increased from 276 to 380 and the value of products from $24,670,000 to $47,358,000. Thirty-ninth in population among the cities of the country, Richmond ranks fifty-fourth in the value of its products, which outrank in value those of six different states. One out of every six persons in the state of Virginia who are engaged in manufacturing industries is employed in Richmond; one out of every seven dollars of the state's total capital invested in industry is used in Richmond, which produces one-fifth of the state's total manufactured product.

One out of Every Two Persons is Employed. In 1910 approximately 63,000 persons were engaged in various employments. Out of every 100 of these 40 were employed in manufacturing and mechanical industries, 23 in domestic and

personal service, 14 in trade and commerce, 8 in transportation, 8 in clerical occupations, 4 in professional service and the remaining 3 in miscellaneous pursuits.

The Problem Is Primarily One of Training a Native Population. Less than 4 out of every 100 of Richmond's inhabitants are foreign born. About 70 of every 100 of the native inhabitants were born in Richmond and 86 of every 100 in Virginia. Only two (Charleston, S. C., and Wheeling, W. Va.) of the 109 cities of 50,000 or more inhabitants in the U. S., according to the Census of 1910, returned a larger portion of their population as born in the state in which the city is located.

The Number of Females Greatly Exceeds Males. While in the state of Virginia the number of males is practically equal to the number of females, in Richmond the proportion of males to females is as 91 to 100, the excess of females over males being particularly marked among the negroes. With the single exception of Nashville the ratio of males to females is lower than in any other large southern city.

More Than One-Third of the Inhabitants Are Negroes. During the last thirty years the ratio of negroes to whites has been slowly decreasing. With the exception of Memphis and Birmingham, Richmond has a larger proportion of negro population than any other southern city of more than fifty thousand people.

Illiteracy, While Large, Is on the Decrease. One hundred and ninety-six out of every 1,000 negroes ten years of age and over in Richmond are unable to read and write, the average for cities of 100,000 and over in the country as a whole being 126, and for Virginia almost three hundred. During the past thirty years illiteracy among the negroes in Richmond has declined rapidly, four hundred and fifty-seven out of every 1,000 of them being reported as illiterates in 1890. On the other hand, only twelve out of every 1,000 native whites can neither read nor write, which is just one-half the number who were so reported thirty years ago. The proportion of illiterates among the native whites in cities of 100,000 and over for the entire country is four out of every 1,000 and in the state of Virginia eighty.

The Educational Problem of Richmond. The significant factors are two: (1) The large proportion of native whites of native parentage in the white population; (2) The large proportion of negroes in the total population. Richmond is not confronted with the task of assimilating a large foreign element, but rather with that of training its native population for efficiency.

SECTION III

THE PUBLIC SCHOOLS OF RICHMOND

The Public School System. The public schools of Richmond are administered by a school board of nine members appointed, three each year, by the City Council. The annual expenditures are approximately three-quarters of a million dollars, of which about one-tenth comes from the state and nearly nine-tenths must be voted each year as appropriations of the City Council. Thus the school board has only indirect control over the amount, and in some measure over the distribution of its funds. There are 35 school buildings of which 22 are occupied by white children and 13 by colored children.

Public School Enrollment Over 22,000. The total enrollmen in the public schools in 1913-14 was 22,459 divided as shown in Table 1.

TABLE 1

TOTAL ENROLLMENT AND AVERAGE ATTENDANCE IN PUBLIC SCHOOLS IN 1913-14

	White	Colored	Total enrollment	Total average attendance	Per cent attendance
Kindergarten	783	33	816	443	80.9
Special	203	.....	203	.....	....
Elementary	9,768	5,916	15,684	12,760	94.0
High	1,593	358	1,951	1,509	95.6
Normal	21	38	59	.....	....
Night	2,571	1,175	3,746	1,701	80.0
Total	14,939	7,520	22,459		

The figures in Table 1 giving the per cent of attendance are based on average monthly enrollment, not on total enrollment.

3660 *Children in Private and Parochial Schools.* Compared with most other cities of similar size, Richmond has few children in private and parochial schools. The number reported for the city for 1913-14 was 3,660.

School Attendance. School attendance in Richmond is not compulsory and previous to this year children have not been admitted to the public schools before the age of seven. For these reasons this city has a smaller proportion of children in school than is the case in cities having compulsory education and admitting children at five or six years of age. According to the data presented by the United States Census for 1910, 88 per cent of the white children and 77 per cent of the colored children between the ages of 10 and 15 had attended some school during the previous year. As compared with the five other Southern cities of more than 100,000 population, this city made an average showing with respect to the proportion of children in school attendance between the ages of 10 and 15. Memphis and Nashville have a slightly larger proportion of their white children of these ages in school, while Atlanta, Birmingham, and New Orleans make somewhat poorer showings. With respect to their colored children of these ages, Birmingham and Nashville do a little better than Richmond, while the records of Atlanta, Memphis, and New Orleans are not quite so good. A similar situation exists when Richmond is compared with the four other cities of Virginia. Norfolk and Portsmouth have a slightly smaller proportion of their colored children of these ages in school, while Lynchburg and Roanoke do somewhat better. With respect to the proportion of white children of these ages in school, all of the four other Virginia cities make somewhat better showings than does Richmond.

Attendance is Not Compulsory. Section 138 of the State Constitution provides that the General Assembly may "provide for the compulsory education of children between the ages of eight and twelve years, except such as are weak in body or mind, or can read and write, or are attending private schools, or are excused for cause by the district school trustees."

In accordance with this provision, Section 95 of the School Laws provides that any county, city, or town may establish compulsory education when the school board submits the question to a vote of the people at any general election and the resulting vote is in favor of the proposition. Provision is also made for securing the referendum vote by means of a petition.

When compulsory education is established in any locality, the law provides that parents or guardians having control of any child between the ages of eight and 12 years must send it to the public school for at least 12 weeks in each school

year, at least six of which shall be consecutive, unless the school trustees excuse the child, or unless he be weak in body or mind, or can read and write, or is attending a private school, or lives more than two miles from the school, or more than one mile from the free school wagon route.

Richmond has not yet adopted compulsory education under the provisions of this law, but a vote on the question will be taken in November, 1914.

An amendment in the law so as to provide for attendance during the full school term could be enacted legally at any session of the General Assembly. To secure an amendment to the constitution would probably require about five years. The past session of the General Assembly appointed a codification commission which may recommend changes in the law or the constitution, or both.

Compulsory Education Would Increase School Attendance by About 1,050. If Richmond adopts compulsory education by popular vote in November, the result will be to bring into school all the children aged eight, nine, 10, and 11 years who are not now in attendance. A computation has been made based on the figures for age distribution and school attendance of the census of 1910 to discover the number of boys and girls, white and colored, at each of these four ages as well as the number attending school and the number not attending school. These figures, as increased to indicate conditions in 1914, and corrected by reference to the present age, sex, and color figures of the public schools, show that there are approximately 1,050 children of these four ages who are not in school and who would presumably attend were compulsory education enforced. The distribution of these children is shown in Table 2.

TABLE 2

CHILDREN BETWEEN THE AGES OF EIGHT AND 12 WHO ARE NOT NOW IN PUBLIC OR PRIVATE SCHOOLS AND WHO WOULD ATTEND IF COMPULSORY EDUCATION WERE ENFORCED

Age	White boys	White girls	Colored boys	Colored girls	Total
8	22	33	96	70	221
9	2	33	93	47	175
10	65	70	105	82	322
11	62	62	137	71	332
Total	151	198	431	270	1,050

It must be remembered that the figures of Table 2 are at best only a careful estimate derived from the Census data. It is nearly certain, for example, that there are more than two white boys nine years of age out of school. Nevertheless it is believed that the figure 1,050 fairly represents the number of children of these ages who would be brought into school by the enforcement of the compulsory education law. The figure is probably an under-statement rather than an over-statement.

Child Labor is Prohibited. The Virginia child labor law became effective July 1, 1914. It prohibits the employment in industrial and mercantile establishments of children under 14 and requires employment certificates issued by a notary public for children between 14 and 16. Employers of such children must post a list of their names near the entrances of their establishments. In cities of 5,000 population or over, boys under 10 and girls under 16 may not sell periodicals on the street and children under 14 may not be employed in messenger service. The law exempts mercantile establishments in towns of under 2,000 population and fruit and vegetable packing establishments between July 1 and November 1. Parents are permitted to work their own children in their own establishments. The school authorities have nothing to do with the enforcement of the law or the issuance of employment certificates.

FINANCIAL SUPPORT OF THE PUBLIC SCHOOLS

Richmond a Relatively Wealthy City. According to the report of the United States Census on Financial Statistics of Cities for 1913, there are 40 American cities of from 100,000 to 300,000 population. With respect to population, Richmond is in the middle of this group, 20 of the cities being larger and 19 smaller. The per capita wealth of the people living in these 40 cities is $1,245. In Richmond the per capita wealth is $1,489 and the city ranks in seventh place in this comparison. Richmond possesses decidedly more taxable property for each inhabitant than the average of the cities of her class.

Richmond's Expenditures for Schools Are Low. The Census report on cities for 1912 listed 38 cities of from 100,000 to 300,000 population. In this group of 38 cities the annual

expense for schooling for each child in average attendance in elementary schools was $35, whereas in Richmond it was only $24. The corresponding figures for the high schools were $77 for the group and $53 for Richmond. In the night schools the corresponding figure was $16 for the group and $12 for Richmond. The corresponding data for 1913 are not yet available.

School Expenditures Low as Compared with Wealth. According to the Census report on cities for 1913, these cities of from 100,000 to 300,000 population spend annually $3.64 on the support of public schools for each $1,000 worth of taxable property that they possess. Richmond, on the same basis, spends only $1.94. This may be stated in another way by saying that in proportion to wealth the expenditures of this group of cities for school support is $1.87 for each $1.00 that Richmond spends.

Rank in Per Capita and Percentage Expenditures. The Census Report on Financial Statistics of Cities for 1913 gives the expenditures per capita of population for the support of the different divisions of municipal government. It also gives figures showing the per cent of the total municipal expenditures devoted to each of these purposes. These two sets of figures enable us to discover how Richmond compares with her sister cities in the amount spent for each inhabitant on the support of each branch of municipal government and also how she compares in the per cent of her total annual expenditures for running expenses devoted to each separate purpose. The standing of Richmond among these 40 cities of from 100,000 to 300,000 population is shown in Table 3, in which the figures represent the rank of this city among the 40 cities.

The figures of this comparison show that both absolutely and relatively the expenditures of Richmond for the support of public education are low.

TABLE 3

THE RANK OF RICHMOND AMONG THE 40 CITIES OF 100,000 TO 300,000 POPULATION IN PER CAPITA EXPENDITURES AND IN PER CENT OF TOTAL EXPENDITURES DEVOTED TO EACH BRANCH OF MUNICIPAL GOVERNMENT IN 1913

Rank in per capita expenditures	Rank in per cent of total expenditures
1	1 Highways
2	2
3 Highways	3
4 Sanitation	4 Sanitation
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15 Charities and corrections	15
16	16 Charities and corrections
17 Police	17
18	18
19	19 Police
20	20 Recreation
21	21
22 Recreation	22
23	23
24	24
25	25
26 Fire	26
27 General	27 General
28	28
29	29 Fire
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38 Schools	38
39	39
40	40 Schools

Ages at Which Pupils Leave School. Relatively few children permanently leave school in Richmond before the age of 13. After 14 they begin to fall out rapidly. It is approximately true that of each 1,000 boys and girls, white and colored, the number remaining in school at each age is as indicated in Table 4. This and the following computations of elimination are based on the age and grade distribution tables for the years 1911-12, 1912-13, and 1913-14.

TABLE 4

APPROXIMATE NUMBER OF SCHOOL CHILDREN AMONG EACH 1,000 BEGINNERS REMAINING IN SCHOOL AT EACH AGE

Age	White boys	White girls	Colored boys	Colored girls
11	1,000	1,000	1,000	1,000
12	977	1,000	1,000	1,000
13	901	914	837	918
14	737	792	617	777
15	478	560	343	493
16	267	376	161	319
17	141	215	64	191
18	49	94	33	115
19	11	26	11	65
20	2	5	2	24
21	....	1	1	5

It is to be noted that among both the white and colored the girls stay in school considerably longer than the boys.

Grades at Which Pupils Leave School. More than half of the white children, but considerably less than half of the colored ones, complete the elementary grades. It is approximately true that of each 1,000 boys and girls, white and colored, the number remaining in school at each grade is as indicated in Table 5.

TABLE 5

APPROXIMATE NUMBER OF SCHOOL CHILDREN AMONG EACH 1,000 BEGINNERS REMAINING IN SCHOOL AT EACH GRADE

Grade	White boys	White girls	Colored boys	Colored girls
1	1,000	1,000	1,000	1,000
2	1,000	1,000	1,000	999
3	1,000	998	959	983
4	990	991	842	954
5	945	975	673	866
6	781	881	448	621
7	568	738	272	439
High School				
I	428	495	132	269
II	232	276	67	182
III	134	180	34	123
IV	94	156	26	110

The figures indicate that during their years of schooling the colored children make distinctly less progress than the white ones. It is most significant that in Richmond among both white and colored children the girls stay in school longer and make better progress than the boys. This condition is so marked that the proportion of colored girls completing the high school course is greater than the proportion of white boys completing the high school course.

Data Secured Through 13 *and* 14 *Year Old Children.* A considerable portion of the work of the school inquiry consisted of a study of certain facts concerning all of the 13 and 14 year old boys and girls in the public schools, their fathers, and their older brothers and sisters. The study was confined to the 13 and 14 year old children because those are the last years before many of them drop out of school. For this reason social data concerning all of the 13 and 14 year old children present a fairly complete and unselected cross section of the social and industrial levels of the city's population. Moreover, since children of these ages leave school in large numbers to go to work, they may fairly be considered the raw material of vocational education. In all, information was gathered from 6,591 persons, the data being secured by means of schedules filled out by the 13 and 14 year old school children assisted by their teachers or principals, and from schedules filled out by the older brothers and sisters of these children. These cases were not selected in any way. They include data for all of the 13 and 14 year old children in the public schools for whom the facts could be secured and for the fathers, and older brothers and sisters of these children. In all, data were gathered from 6,591 persons as follows:—

839 white boys 13 and 14 years old
930 white girls 13 and 14 years old
295 colored boys 13 and 14 years old
526 colored girls 13 and 14 years old
1,769 fathers of 13 and 14 year old white children
821 fathers of 13 and 14 year old colored children
618 older brothers of these white pupils—gainfully employed and under 21 years of age
350 older sisters of these white pupils—gainfully employed and under 21 years of age
297 older brothers of these colored pupils—gainfully employed and under 21 years of age
146 older sisters of these colored pupils—gainfully employed and under 21 years of age

Total 6,591

Thirteen and 14 *Year Old Children in All Grades from First Elementary to Third High.* The first data secured showed the school grades of the children and brought to light three significant facts. The first is that although these boys and girls are of nearly the same ages, they represent almost every stage of school advancement and are scattered through the grades from the first elementary to the third high. The second fact is that one-half of these white boys and girls are in the 6th grade or below. The third significant fact is that more than half of the colored boys and girls are in the 5th grade or below. These figures indicate that large numbers of these boys and girls may be expected to leave school soon and go to work with an educational preparation so inadequate as to hamper them in their vocations and seriously to reduce their value to the community. This situation is important from the point of view of vocational education. The figures showing how these 2,590 boys and girls are distributed through the grades are presented in Table 6.

TABLE 6

GRADES OF 13 AND 14 YEAR OLD BOYS AND GIRLS IN MAY, 1914

Grade	White boys	White girls	Colored boys	Colored girls
Special	5	....	....	....
1	1	....	4	8
2	2	....	28	20
3	27	15	30	54
4	79	56	55	98
5	150	156	74	126
6	205	221	58	117
7	212	285	36	63
High School				
I	123	161	10	37
II	31	34	....	3
III	4	2	....	....
Total	839	930	295	526

Birthplaces of Fathers and Children. The next facts secured were data giving the birthplaces of the children and their fathers. They showed that about nine-tenths of the Richmond school children and more than five-sixths of their fathers were born either in the city of Richmond or elsewhere in Virginia. This statement is based on data concerning the birthplaces of 1,769 white children, 1,769 white fathers, 821 colored children, and 821 colored fathers. The percentage figures showing the birthplaces are presented in Table 7.

TABLE 7

BIRTHPLACES OF 13 AND 14 YEAR OLD SCHOOL CHILDREN AND THEIR FATHERS

Birthplace	White		Colored	
	Children	Fathers	Children	Fathers
City of Richmond	70	37	81	48
Elsewhere in Virginia	17	38	14	36
Other state in U. S.	11	16	5	15
Foreign country	2	9	..	1
Total	100	100	100	100

Most other cities of similar size have far more migratory populations than Richmond. The data indicate that if present conditions maintain in the future Richmond may safely train a larger proportion of her children for future participation in her local industries than would be wise for the average city.

Occupations of Fathers, Older Brothers, and Older Sisters of School Children. Data were secured as to the occupations of all of the brothers and sisters and nearly all of the fathers of these school children. Their occupational distribution is shown in Table 8.

TABLE 8

OCCUPATIONAL DISTRIBUTION OF FATHERS, BROTHERS, AND SISTERS OF 13 AND 14 YEAR OLD SCHOOL CHILDREN

Occupational Group	White fathers	White brothers at work	White sisters at work	Colored fathers	Colored brothers at work	Colored sisters at work
Extraction	24	4	..	8	3	..
Building trades	243	59	..	80	12	..
Manufacturing, metal	229	70	..	44	9	..
Manufacturing, other	248	122	121	73	31	22
Transportation	205	34	25	127	63	..
Trade	358	131	57	54	24	..
Public service	78	17	..	21	6	..
Professional service	64	10	7	17	1	7
Domestic and personal	59	8	1	274	127	112
Clerical	85	163	139	25	21	5
Total	1,593	618	350	723	297	146

Occupations of Older Brothers and Sisters Educationally Important. It is important to consider the nature of the occupations in which the older brothers and sisters of these school children are engaged because they furnish the most reliable available index to the sorts of occupations which the boys

and girls now in school may be expected to enter during the next few years.

Most Numerous Occupations of the White Older Brothers. Nearly two-thirds of the white older brothers are engaged in 13 occupations. These occupations, which include all engaging 10 or more, are listed in Table 9.

TABLE 9

WHITE BROTHERS (OF 13 AND 14 YEAR OLD SCHOOL CHILDREN) ENGAGED IN ALL OCCUPATIONS INCLUDING 10 OR MORE WORKERS

Occupation	Workers
Clerks	115
Salesmen	99
Machinists	27
Plumbers	22
Printers and Pressmen	21
Messengers	16
Teamsters	16
Iron and steel workers	13
Electricians	13
Stenographers	13
U. S. Sailors	13
Operatives, tobacco	10
Painters	10
Total in these occupations	388
Total reporting	618
Per cent in these occupations	63

It is noteworthy that more than one-third of all of the white brothers for whom we have information are engaged as clerks or salesmen. The first seven occupations listed include more than one-half of all the cases.

Four-fifths of White Older Sisters in Seven Occupations. Four-fifths of the white older sisters are engaged in seven occupations. These occupations, which include all engaging 10 or more, are listed in Table 10.

TABLE 10

WHITE SISTERS (OF 13 AND 14 YEAR OLD SCHOOL CHILDREN) ENGAGED IN ALL OCCUPATIONS INCLUDING 10 OR MORE WORKERS

Occupation	Workers
Stenographers	78
Operatives, tobacco	69
Saleswomen	55
Clerks	24
Telephone operators	24
Operatives, paper	18
Bookkeepers	11
Total in these occupations	279
Total reporting	350
Per cent in these occupations	80

It is significant that more than one-fifth of all these young women are stenographers, another fifth operatives in tobacco factories, and nearly one-sixth of them saleswomen.

Two-thirds of Colored Older Brothers in Five Occupations. Two-thirds of the colored older brothers are engaged in five occupations. These occupations, which include all engaging 10 or more, are listed in Table 11.

TABLE 11

COLORED BROTHERS (OF 13 AND 14 YEAR OLD SCHOOL CHILDREN) ENGAGED IN ALL OCCUPATIONS INCLUDING 10 OR MORE WORKERS

Occupation	Workers
Porters, trade	74
Teamsters	49
Laborers	44
Messengers	15
Operatives, tobacco	14
Total in these occupations	196
Total reporting	297
Per cent in these occupations	66

Four-fifths of Colored Older Sisters in Four Occupations. Four-fifths of the colored older sisters are engaged in four occupations. These occupations, which include all engaging 10 or more, are listed in Table 12.

TABLE 12

COLORED SISTERS (OF 13 AND 14 YEAR OLD SCHOOL CHILDREN) ENGAGED IN ALL OCCUPATIONS INCLUDING 10 OR MORE WORKERS

Occupation	Workers
Servants	48
Laundresses	37
Nurse girls	19
Operatives, tobacco	11
Total in these occupations	115
Total reporting	146
Per cent in these occupations	79

Reasons for Leaving School. Among the 620 older brothers and sisters at work, reasons were given for leaving school as shown below. The distributions of these reasons is about the same for the boys and the girls, the white and the colored.

REASONS GIVEN FOR LEAVING SCHOOL

To go to work	260
Wanted to	62
Poor health	56
To support family	50
Had to go to work	31
Graduated	26
To learn a trade	22
Failure in studies	16
Moved	9
Disagreement with teacher	8
To accept position	6
Miscellaneous	14
Not stated	60
Total	620

Age at Beginning Work. The age at beginning work ranges from eight to 20 with an average of a little over 15 years for white and colored boys and not quite 16 for white and colored girls.

Schooling Received Before Children Went to Work. The amount of schooling received before these young people went to work ranges from the first grade to the complete high school course. The average amounts were as follows:

Colored boys	4th grade
Colored girls	5th grade
White boys	6th grade
White girls	7th grade

Number of Positions Held by Older Brothers and Sisters. Six hundred and twenty of the older brothers and sisters supplied data as to the number of different positions they had held since going to work. These range from one to seven positions apiece as shown in Table 13.

TABLE 13

OLDER BROTHERS AND SISTERS (OF 13 AND 14 YEAR OLD SCHOOL CHILDREN) WHO HAVE HELD EACH SPECIFIED NUMBER OF POSITIONS SINCE GOING TO WORK

Number of positions	White brothers	White sisters	Colored brothers	Colored sisters
1	140	99	76	56
2	61	32	23	9
3	56	9	17	4
4	10	3	12	2
5	3	..	3	1
6	1	..	2	..
7	..	..	1	..
Total	271	143	134	72

Part-time Schooling of Young People at Work. Among these 620 young people at work, 365 have never attended evening school. The remaining 255 have attended for periods ranging from three nights to seven years, with an average of about three months.

Correspondence Courses. Among the 620 young people at work, 36 have taken correspondence courses, the majority being taken by white boys.

An analysis of the figures shows that the four groups differ but little in the average number of years they have been at work and in the average number of different jobs they have held for each year they have been at work. These average figures are as follows:—

	White brothers	White sisters	Colored brothers	Colored sisters
Average years at work....	2.6	2.2	3.1	2.7
Average jobs per year.....	.69	.65	.62	.51

These figures would seem to indicate that the colored boys and girls have on the average been at work somewhat longer than the white boys and girls and that the white boys and girls have changed positions with somewhat greater frequency. It must be remembered that the white boys and girls have more opportunity to change from one sort of occupation to another, while the colored boys and girls, whose work is largely that of personal service in families and small establishments, probably have greater opportunity to change from position to position within the same occupation. The differences, however, are not sufficiently marked to be of great significance and it is doubtful if they should be taken too seriously.

Number of Years at Work and Positions Held. Of these boys and girls who were at work, 586 had been employed for periods ranging from one to five years. If we compute for the entire group the average number of positions held, we have results as follows:—

Years at work	Average number of jobs held
1	1.4
2	1.7
3	1.6
4	1.7
5	2.2

These results are approximately the same as they would be if they were presented separately for boys and girls, white and colored. They seem to indicate that there is comparatively

infrequent shifting from position to position and that a considerable portion of the shifting that does take place occurs during the first year. It may well be doubted whether these figures are highly accurate. They do, however, corroborate the other evidence that employments in Richmond are relatively stable.

Ages and Wages of Young People at Work. Data are available showing the ages and wages of 496 older brothers and sisters of the school children. All of them are employed and they are all under 21 years of age. In Table 14 "$2 to $4" means $2 but less than $4, etc.

TABLE 14

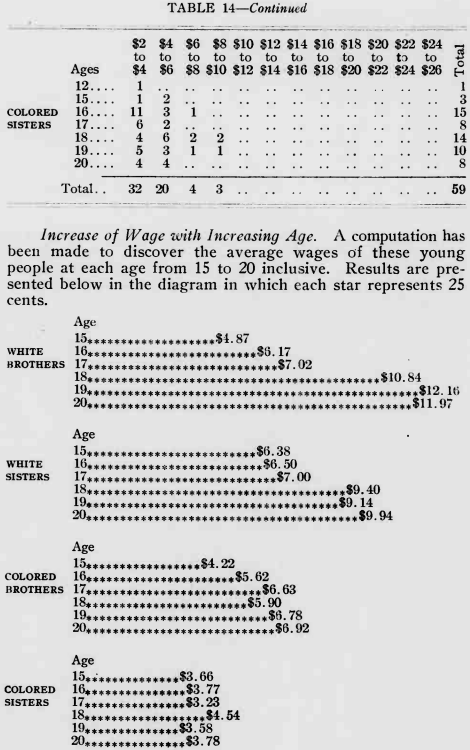
WEEKLY WAGES OF OLDER BROTHERS AND SISTERS OF 13 AND 14 YEAR OLD SCHOOL CHILDREN

	Ages	$2 to $4	$4 to $6	$6 to $8	$8 to $10	$10 to $12	$12 to $14	$14 to $16	$16 to $18	$18 to $20	$20 to $22	$22 to $24	$24 to $26	Total
	14....	..	1	1	1	..	..	..	..	..	..	..	..	3
	15....	4	7	4	..	1	..	..	..	..	..	..	..	16
WHITE	16....	4	16	8	2	2	2	1	..	..	..	..	..	35
BROTHERS	17....	1	11	17	6	1	8	1	..	..	..	..	..	45
	18....	..	3	15	8	8	4	4	..	2	..	..	1	45
	19....	..	1	3	8	12	6	6	..	2	..	1	..	39
	20....	..	2	2	3	5	6	6	2	1	1	..	..	28
	Total..	9	41	50	28	29	26	18	2	5	1	1	1	211
	Ages													
	14....	..	1	..	..	..	..	..	..	..	..	..	..	1
	15....	1	5	1	3	..	1	..	..	..	..	..	..	11
WHITE	16....	..	8	8	6	2	..	..	..	..	..	..	..	24
SISTERS	17....	1	4	12	5	1	2	..	..	..	..	..	..	25
	18....	..	2	5	4	9	1	2	1	..	..	..	..	24
	19....	..	2	4	7	7	2	1	..	..	..	..	..	23
	20....	..	..	4	4	3	1	3	..	..	..	..	..	15
	Total..	2	22	34	29	22	7	6	1	..	..	..	..	123
	Ages													
	12....	..	1	..	..	..	..	..	..	..	..	..	..	1
	13....	2	..	..	..	..	..	..	..	..	..	..	..	2
	14....	..	1	..	1	..	..	..	..	..	..	..	..	2
COLORED	15....	4	3	2	..	..	..	..	..	..	..	..	..	9
BROTHERS	16....	4	12	5	3	1	..	..	..	..	..	..	..	25
	17....	3	4	6	4	..	1	..	..	..	..	..	..	18
	18....	3	7	6	1	1	1	..	..	..	..	..	..	19
	19....	..	4	6	6	..	..	..	..	..	..	..	..	16
	26....	..	3	5	2	1	..	..	..	..	..	..	..	11
	Total..	16	35	30	17	3	2	..	..	..	..	..	..	103

TABLE 14—*Continued*

	Ages	$2 to $4	$4 to $6	$6 to $8	$8 to $10	$10 to $12	$12 to $14	$14 to $16	$16 to $18	$18 to $20	$20 to $22	$22 to $24	$24 to $26	Total
	12....	1	..	..	..	..	..	..	..	..	..	..	..	1
	15....	1	2	..	..	..	..	..	..	..	..	..	..	3
COLORED	16....	11	3	1	..	..	..	..	..	..	..	..	..	15
SISTERS	17....	6	2	..	..	..	..	..	..	..	..	..	..	8
	18....	4	6	2	2	..	..	..	..	..	..	..	..	14
	19....	5	3	1	1	..	..	..	..	..	..	..	..	10
	20....	4	4	..	..	..	..	..	..	..	..	..	..	8
	Total..	32	20	4	3	..	..	..	..	..	..	..	..	59

Increase of Wage with Increasing Age. A computation has been made to discover the average wages of these young people at each age from 15 to 20 inclusive. Results are presented below in the diagram in which each star represents 25 cents.



These data reveal four significant conditions:—

1. The earnings of the boys are larger than those of the girls, especially at the upper ages.
2. The earnings of the whites are larger than those of the colored, especially at the upper ages.
3. Among white boys and girls earnings show a marked increase at the age of 18.
4. Among colored boys and girls earnings show little increase with advancing age and this is especially true among the girls.

PRESENT STATUS OF TECHNICAL AND INDUSTRIAL EDUCATION

Manual Training and Domestic Science from Fifth Grade Up. In all the schools of Richmond, both white and colored, courses in manual training and domestic science are offered from the fifth grade up. This work had its inception 11 years ago. About half of the schools have well equipped centers in which these classes are carried on and to which children go from the other schools for this work. Of the 20 buildings for white children, 10 are equipped as manual training centers and nine as domestic science centers. Of the 11 buildings for colored children, five are equipped as manual training and domestic science centres. All of the classes meet once a week, the period for the fifth grade children being 45 minutes, for the sixth grade 60 minutes, and for the seventh grade 90 minutes. This manual training and domestic science work, while of conventional type, is of distinctly better than average quality. Most of the instructors are unusually practical and progressive. During the past two years there has been in existence an ungraded prevocational class composed of about 20 boys of upper elementary school ages, one-half of whose time has been given to classroom work and the other half to manual work.

Classes in Evening Elementary Schools. There are four white and two colored evening elementary schools giving instruction in woodworking and domestic science. The session of these classes ranges from one to two hours per week during the 30 weeks that the schools are open.

Classes and Courses in Day High School. The white and colored high schools both maintain commercial courses and

courses for the training of teachers. In addition, both schools offer courses in domestic science, shop work, mechanical drawing, and applied art. The material equipment and teaching personnel in the John Marshall High School for white students are particularly good. The popularity of these courses in this school is steadily increasing. During the second session of the school year, 1913-14, the total enrollment in the manual arts course was 126; in the commercial course 187; and in the short commercial course 129. In addition, a considerable portion of the 468 pupils in the elective course and the 59 special pupils were taking work in manual arts or commercial subjects.

The John Marshall Night School. The John Marshall Night School is conducted in the John Marshall High School building and has been in operation three years. It offers courses in general education, shop work, commercial branches, and household arts. Thirty-one of the 44 members of the teaching staff are college students or teachers in the public schools. The remainder are engaged during the day in commercial and professional pursuits, excepting two millinery teachers and four housekeepers. The school is open six and one-half months, from October to April, three nights each week. About two-thirds of the students attend three nights a week and the remaining third one night a week. The sessions are from 7:30 to 9:30. The minimum entering age is 14 years and the average age is between 16 and 17 years. The student body is nearly equally divided between the two sexes.

Over one-half of the total time is devoted to general education, that is, work of the upper elementary and high school grades. About 36 per cent is devoted to commercial subjects; 11 per cent to household arts; and less than three per cent to industrial subjects. The total enrollment for the past year was 1,521, while the average attendance was 615. Sixty per cent of the pupils attended less than half the number of nights the school was open. With the teaching force as it existed at the close of the past school year, a much larger number of pupils could be effectively cared for than were then in attendance.

The Virginia Mechanics Institute. The Virginia Mechanics Institute was founded in 1854 and receives an annual subsidy from the city amounting in 1914 to $11,500, which, combined with moneys received from other sources, makes a total income of about $15,000. The present value of the building and

equipment is estimated at about $125,000. The Institute is governed by a practically self-perpetuating board of 24 members composed of prominent business and professional men. A superintendent, appointed by the board, is in immediate charge of the school. The Institute is entirely independent of the local public school organization. No detailed reports are made to the school board or the city council as to the financial and educational administration.

The Institute offers courses in general, engineering, shop, and commercial subjects. Six of its 29 teachers are employed by day in mechanical work and the building trades and six are mechanical or civil engineers. Ten of them hold other teaching positions.

The school is open seven months in the year, five nights a week, from 7:30 to 9:30. It is open only in the evening. With the present teaching force the maximum capacity of the school is about 340 students per night, which would be equal to a yearly output of 95,200 student hours on the present basis of 140 sessions of two hours each. An estimate based on the available data gives as the actual output for the past year 57,820 hours. It thus appears that with the present financial resources the output of the school could be considerably increased. With more ample resources the year might be extended to 40 or 50 weeks and, if conditions warranted, day sessions could be established. By such changes the output of the school could be increased anywhere up to ten times the present amount. It is not suggested that this should be done, but the possibility exists should the need arise.

Boys only are admitted and their ages range from 15 years up, the average being about 19. About one-seventh of the students are over 24 years of age. Each student pays $3 for the first course and $1 for each subsequent course. The average enrollment during the past year was 387, but this does not represent the number attending or expected on any one night. Part of these students receive instruction two nights a week and the remainder three. Less than one student in five attended more than one-half of the nights that the school was in session during the past year.

The machine shop equipment was largely donated by the locomotive company and is mostly too big and too old for the most effective use. The Institute has a library of something over 5,000 volumes.

No State Aid for Industrial Education. Richmond now receives no state aid for industrial education. Under the Virginia Vocational Education Law, the legislature is authorized

to appropriate and the state board of education to distribute funds appropriated for the support of industrial, agricultural, household arts, and commercial education. The same law authorizes any school district to establish all day, part time, continuation, or evening classes designed to meet the vocational needs of persons over 14 years of age of less than college grade. Under this law the state appropriates $30,000 a year for the support of agricultural education in the rural districts. Thus far no appropriation has been made for the other three forms of practical training or for work of any kind in the cities. While the law authorizes the employment of supervisors for vocational schools, the state board has as yet employed none.

State Funds Could Be Wisely Appropriated in Aid to Vocational Education in Richmond. The city of Richmond pays into the state treasury far more than it receives for educational purposes. For every $5.00 the city pays into the general school fund, it receives back only $2.00 for school support. The state gives each year from the general fund $275,000 for rural elementary schools, $100,000 for rural high schools, $30,000 for agricultural, and $20,000 for normal high schools. The Richmond schools receive no part of this money. It seems apparent that the state might with great propriety and wisdom appropriate money in partial support of vocational education in the cities. This would be particularly fitting in the case of Richmond, the capital city, which should and does serve as an experimental station and practical demonstration for the other cities of the state.

SECTION IV

THE INDUSTRIAL SURVEY

Fields of Employment in Richmond. According to the U. S. Census Volume on Occupations for 1910 the following are the occupational groups of Richmond in the descending order of the number of workers which they include:—

TOTAL PERSONS 10 YEARS OF AGE AND OVER ENGAGED IN EACH SPECIFIED OCCUPATION, CLASSIFIED BY SEX, FOR CITY OF RICHMOND
(13th U. S. Census, 1910, Vol. IV, pp. 194–206)

Occupational Groups	Sex		Total Employed	
	Male	Female	Number	Per Cent
Manufacturing and mechanical industries	19,214	5,886	25,000	40.00
Domestic and personal	3,391	10,909	14,300	22.79
Trade	7,862	1,183	9,045	14.41
Transportation	5,047	159	5,206	8.29
Clerical occupations	3,470	1,589	5,059	8.06
Professional service	1,444	1,273	2,717	4.33
Public service	913	7	920	1.46
Agriculture, forestry, animal husbandry	310	7	317	.50
Extraction of minerals	76	.....	76	.12
All occupations	41,727	21,013	62,740	100.00

The Report is Primarily Concerned with Wage-Earners, Particularly Industrial Workers. It is not concerned with the training of persons in Richmond who according to the census are engaged in transportation, professional service, public service, agriculture, or the extractive industries, but is either directly or indirectly concerned with those who are engaged in manufacturing and mechanical pursuits, domestic and personal service, and department store employment.

The Scope of the Survey includes analyses of four large mechanical industries of Richmond and in addition the department stores. The four industries embrace 108 occupations, distributed as follows:

26 in the printing trades,
35 in the building trades,
30 in the metal trades,
17 in the tobacco industry.

These 108 occupations and the department stores represent more than 15,000 workers, embracing the principal well-defined skilled occupations and a very considerable number of semi-skilled and unskilled employments. Other industries, such as box-making, paper and pulp works, canning and preserving, and baking powder industries, while important, employ relatively few skilled workers, their product being produced largely by automatic machines. The leather industry employs a large number of workers, but is to a considerable extent a jobbing industry, except in the shoe factory where the work is done on automatic machines, and in the harness works where the skilled workers are few in number.

As regards the women workers in Richmond the survey is concerned primarily with those employed in trade and tobacco manufacturing. It does not include analyses of dressmaking and millinery, the traditional skilled trades for women, owing partly to the limited time available, partly to the fact that a knowledge of these trades is already in hand, and partly to the fact that the need for information with reference to semi-skilled and unskilled employment is, at this time, much greater. The tobacco industry was studied as typical of the industries employing largely semi-skilled and unskilled workers as well as because it is one of the largest employers of women in Richmond.

The information concerning these groups of trades and occupations was secured through two types of schedules:

I. The Establishment Schedules, representing concerns, as noted above, employing more than 15,000 workers.

II. The Individual Schedules obtained from more than 700 workers representing all the important occupations in the five groups noted.

Method of the Industrial Survey.—Eight months' time was given to the survey, which was directed by Mr. Charles H. Winslow and a corps of 20 workers, of whom 17 were men and 3 were women. In addition there was an office force of 5 clerks and stenographers. The field work required six months, during which time as least 6 people were continuously employed. All the agents were regularly employed, no volunteer help being utilized in this portion of the Survey. Much night work was done.

Interviews were held with employers to explain the purpose of the Survey and the filling out of the schedules and to secure their co-operation. Interviews were held also with workers in the shops or at their regular meeting places for the same purposes. Each interview represented a personal conference of about twenty minutes. Visits were made to shops and factories to study in-

dustrial processes and conditions, and numerous conferences were held with men and organizations familiar with the industrial and commercial conditions of Richmond. All findings based on the data gathered were submitted to employers and workers for criticism. Occupations were studied by trade groups and a complete analysis of each occupation prepared which gives both "Findings about the Occupation" which bear more or less upon the problem of training for it and "Findings about Education for the Occupation" which bear directly upon the problem. This analysis is presented for each trade group briefly in chart form and in text. The information gathered from the workers' schedules will be presented in tables to appear in full in the final report. The information gathered from employers will also be presented in text and tables and will cover similar as well as additional points. See examples on pages 32 and 49.

A Descriptive Analysis of Occupations. As has already been stated, the occupations studied were those belonging to the five industrial or trade groups: printing, metal, building and woodworking, tobacco, and department stores. A description of each of these occupations within a trade group has been prepared by the Industrial Survey which explains the processes or operations carried on in it, the physical, hygienic, and economic conditions of the work, the requirements upon workers and the kind of schooling required. The text for this descriptive analysis, covering as it does many different occupations, is too full for use in this synopsis. One typical study, that of painting, one of the branches of the building trades, has been selected to illustrate the method followed in all and is published in the Appendix at the close of this Report. (See pages 49 to 62.)

A Tabular Analysis of Occupations by Industrial or Trade Groups has been prepared on charts which give for each group a brief tabulation covering all the points about each occupation within the group which admit of tabulation. The purpose of this is to present brief summaries of the full description of each occupation and to show the characteristics of the occupations in comparative form. Two charts for each trade group present the analysis under two general heads—"Findings about the Trade" and "Findings about Education for the Trade."

The Chart on Findings About the Trade gives in comparative form for each of the occupations within the trade or industry the important general information which has a bearing upon training for the trade, and cover the following items:—

Findings About The Trade

Painting

1. **Process**.....Smoothing and cleaning new surfaces, with sandpaper and duster; removing old finishes by burning and scraping, or with paint or varnish solvents. Where the surface is to be painted a priming coat is laid on, all imperfections in the surface filled with putty, and the final coats laid on, each being rubbed down. Where the surface is to be stained and varnished, the stain is applied, the pores of the wood filled, and the several coats of varnish flowed on and rubbed down. Other processes performed by the painter are graining, lettering, stenciling, gold lettering on glass, and kalsomining.

2. **Product or specialties**.....Inside and outside painting and decorating; sign, wagon, carriage, automobile, coach, implement, and furniture painting.

3. **Importance of trade (Number employed)**.....Approximately 600.

4. **Conditions of employment**
   - (a) **That involve physical or nervous strain**.....Close, long continued application to fine work such as coach painting, lettering, striping, and interior decorating.
   - (b) **That stimulate intelligence and interest**.....Inside painting and decorating, sign painting, lettering, and high class finishing.
   - (c) **That narrow or restrict mental development**....Rough outside work or constant exterior painting.
   - (d) **That are in other respects important as affecting the welfare of workers (i. e., liability to accident, occupational diseases)**.....Danger from imperfect scaffold rigging; danger of lead poisoning from uncleanly habits and dry methods of sandpapering; chronic diseases are caused by the use of some quick drying flat paints in poorly ventilated spaces.

5. **Wages**

   Apprentices
   - (a) **Beginning wage**.....$3.00—$4.00 per week.
   - (b) **Second year wage**.....$5.00 per week.
   - (c) **Third year wage**.....$6.00—$7.00 per week.
   - (d) **Fourth year wage**.....$7.00—$9.00 per week.

   Journeymen
   - (e) **Minimum wage**.....$1.50 per day.
   - (f) **Maximum wage**.....$3.00 to $5.00 per day.
   - (g) **Union Scale**.....$3.00 per day.

6. **Hours of labor, regular per day; per week; on Saturdays**.....8 to 9 hours per day; 48 to 54 hours per week; 8 to 9 hours on Saturday.

7. **Seasonal activity**
   - (a) **Busy season**.....March to December, inclusive.
   - (b) **Slack season**.....January and February.
   - (c) **Fluctuation in employment**.....Regulated somewhat by building activities, but men work on the average about ten months in the year.

8. **Extent to which the trade is organized**.....About one-tenth.

9. **Entrance age**.....16 to 18 years.

10. **Years required to learn the trade**.....Four years.

11. **Age of maximum productivity**...22–55 years.

12. **Is the supply of labor adequate to meet the demand? (Cause of deficiency, if any)**.....Supply adequate for present demand for medium grade workers, but the supply of high class workmen is not sufficient to meet the demand.

13. **Is the demand for labor increasing or decreasing?**.....Increasing, especially for efficient skilled workers.

14. **What is the source of supply?**..Boys from the lower grammar grades and casual labor.

Findings About Education for the Trade

15. **What does the worker need to properly equip him for the trade?**
   - (a) **General education**.....At least a complete grammar school education.
   - (b) **Trade and technical education**.....Instruction as to proper rigging of scaffolds; how to keep brushes clean; proper method of spreading colors; neatness in application of colors, especially on inside decorating and lettering; theory and history of the trade; color harmony and design; chemistry of colors and color mixing; mechanical and architectural drawing; sketching; estimating; hygiene of the trade.
   - (c) **Manipulative skill**.....Dexterity in handling brushes in fine decorating and lettering.
   - (d) **Other requirements; Qualities essential; such as accuracy, etc.**..Artistic sense in decorative work; accurate color sense in matching colors; special adaptability; initiative; accuracy; patience; endurance; keenness of sight.

16. **What the industry gives**
   - (a) **Conditions of apprenticeship**.....Apprenticeship period of four years.
   - (b) **Provision made in shops for systematic instruction of apprentices**.....None.
   - (c) **Trade and technical knowledge**.....Only enough trade knowledge to equip worker for immediate productivity.

(d) **Manipulative skill**.....Dexterity in handling brush.

(e) **Extent to which trade can be learned in the shop**.....The trade knowledge required to make the labor productive can be acquired in practice, but very little of the technical knowledge or of the hygiene of the occupation can be so gained.

(f) **Provision made in shops for systematic instruction of journeymen**.....None.

(g) **Line of promotion**.....Apprentice, journeymen, foreman, contractor, employer.

17. **Common deficiencies of workers**.....Deficiency in general education; technical knowledge; and knowledge of hygiene of the trade.

18. I. **What the school ought to give before entering the shop**.....Complete grammar school education; prevocational courses in free hand drawing. Courses in color harmony and design.

II. **What the school ought to give after entering the shop**

(a) **Trade and technical knowledge**.....Specialized courses covering specific trade and technical requirements of painting.

(b) **Manipulative skill**.....The school should provide opportunity for acquiring manipulative skill in special lines of work, such as lettering.

III. **Nature of part-time courses needed**.....Hygiene of the trade; chemistry of trade; color harmony; design; reading of blue prints; mechanical, architectural, and free hand drawing; estimating.

IV. **Nature of evening school courses needed**.....Same as III for apprentices. Advanced special trade courses for journeymen.

Charts for the Four Industrial Groups of occupations found in the printing, building, and metal trades and in the tobacco industry will be available at the convention in Richmond.

FINDINGS BASED ON THE INDIVIDUAL SCHEDULES SECURED FROM WORKERS

In Addition to the Descriptive and Tabular Analysis of Occupations just described, the report gives in ——— tables, with extensive text explanation and comment, a great deal of statistical data about the occupations gathered chiefly from the individual schedules secured from 509 workers in the various occupations of the printing, building, and metal trades. Briefer treatment of similar data for women in tobacco factories and department stores is also included in the report.

Points Covered by the Individual Schedules. The individual schedules supplied a wealth of valuable data which have been tabulated and which will be published in full in the final report. This information furnished conclusive evidence on such important points as the following:—Age distribution of apprentices and workers and the nativity of workers by trades; the regular hours of daily and weekly labor by trades; time lost by workers by trades; causes of loss of time; extent of part-time employment by trades; extent of overtime worked by trades; years of experience as wage-earners of workers; years of experience in present occupation, and in other occupations; age of entrance upon wage-earning occupations by trades; period of apprenticeships served in years by workers in different trades; relation of years of experience to hourly wage; change of place of employment during apprenticeship by trades and reasons for changing; extent to which workers received proper instruction in the shop while learning the trade; highest, lowest, and average wages by occupations within trades; locality in which workers learned trades; change of occupations of present workers by trades; misfits in present positions by trades as to natural ability, training, and experience; employees working under conditions causing strain or impairing health; possibilities of learning different trades completely in the shop; age of leaving school of apprentices and workers by trades; lack of general school training of apprentices and workers; hourly and weekly wages of apprentices and workers by trades.

Impossible to Reproduce the Tables in This Synopsis or Any Considerable Summary or Interpretation of the Tables. The Synopsis can only undertake to state briefly a few of the important conclusions or developments of the tabulations which must be considered in the formulation of any program of industrial education for Richmond. These follow:—

No Children under 14 *Are Employed* in the printing, building, and metal trades. The apprentices in these trades who are very few in number are almost without exception between 16 and 20 years of age. About 14 out of every 100 of the total number of workers covered by the individual schedules were under 21 years of age. 71 out of every 100 were between 21 and 45 years of age. 12 out of every 100 were between 46 and 65 years of age.

Most of the City Workers Are Trained in Richmond. Of every 100 of them, 68 were born in Richmond, 15 elsewhere in Virginia, 14 in other states of the union, and only 3 in for-

eign countries. An unusually large proportion of the city's workers were born and educated in the city and state. Since it seems probable that this condition will continue in the future, Richmond and Virginia seem justified in training a larger proportion of workers for local industries than most other localities.

Nine Hours is the Usual Working Day. An eight hour day was the shortest reported. Out of every 100 workers reporting, it is approximately true that 52 work less than 9 hours, 36 work 9 hours and less than ten hours, and 12 work 10 or more hours. Two-thirds of the workers have a short time Saturday. The employers commonly report a tendency toward a shorter day.

Time Lost from Employment is Relatively Inconsiderable. Out of every 100 of these workers, 53 reported no time lost during the year, 18 lost from one to four weeks, 11 from five to nine weeks, and the remaining 18 lost ten weeks or more. The least time was lost by men in the printing trades, considerably more time by those in the metal trades, and the largest losses were reported by the building trades. With the exception of the building trades, there are few if any seasonal occupations, and there are few if any violent fluctuations in employment.

Little Time Lost by Accidents. Of the workers reporting lost time, the largest number gave temporary lay-off as the reason. The next largest cause was the shutting down of factories, the third in importance was sickness, with accidents a comparatively small fourth.

Part-Time and Over-Time Employment Are Small. The facts about part-time and over-time show once again the comparative regularity of employment.

Workers Shift Employment But Little. The total years of experience of these workers as wage-earners range from one to 60 years. Nearly 40 per cent of them have been at work from 6 to 15 years. The relative infrequency with which Richmond's workers shift from occupation to occupation is shown by the fact that the data as to years of experience in their present occupations differ but slightly from those showing years of experience in any sort of gainful occupation, the per cent of those who have been in their present occupations from 6 to 15 years being 42. Two of every three have never been in any other occupation than the present one.

Few of These Workers Begin under 14 Years of Age. Practically none of these workers in the printing, building, and metal trades became wage-earners before the age of 14. Seven out of every eight began work after they became 15 years of age. More than half entered employment after this age and under 18. Apparently these three highly skilled trades in Richmond do not employ young workers under fourteen and the success of the artisan is not dependent upon his entering the trade at an early age. Apparently the age at which workers in these industries leave school to enter employment has little bearing upon their subsequent earning capacity.

Four Years is the Average of a Variable Period of Apprenticeship. Out of every 100 of these workers, 93 reported that they had served some period of apprenticeship to the trade, ranging in duration from less than three to more than seven years. Exactly one-half of those who have served any apprenticeship gave four years to it. The apprenticeship in the printing trades averages somewhat longer than in the other two.

Wage Increased with Experience. Wage began in each of these three trades at about 15 cents per hour and rose steadily with experience and age for the first ten years of service when it reached about 40 cents per hour and thereafter remained relatively stationary.

Apprentices Shift Employment But Little. Further evidence of the stability of Richmond's workers is furnished by the fact that 69 out of every 100 learned their trade in one shop only, while most of the rest learned it in two shops, and only three in each hundred worked in two or more communities.

Reasons for Shifting among Apprentices. The 151 out of 509 workers who changed their place of employment while learning their trade gave the following reasons for doing so which are listed in the descending order of the frequency with which they are alleged:—

To get wider experience
To get more money
Shop closed
Laid off
Disliked employer
Family moved away
Discharged
Strike

Seven out of Every Ten Learned the Trade in Richmond, and one out of every four elsewhere in the United States. The number of foreign trained workers is negligible. The printing trades contain the largest per cent of workers trained in Richmond and the building trades the smallest.

Few Misfits in the Trades. Of each hundred of the workers answering the question as to whether or not they were working in the occupation for which they were best fitted by natural ability, 61 answered in the affirmative and the remaining 39 in the negative. When the same question was asked them as to training and experience, 89 of each hundred answered in the affirmative and only 11 answered in the negative. It must be remembered that these answers represent only the personal opinions of the men themselves.

More Than One-Third Reported Physical or Nervous Strain. One out of every three workers said that his occupation involved peculiar physical or nervous strain or both. The proportion does not differ greatly for the three groups of trades.

More Than One-Fourth Report Occupational Diseases in Their Trades. One out of every four workers said that he worked in a trade in which there were diseases peculiar to the occupation. This was most frequently reported in the printing less frequently in the metal, and least frequently in the building trades.

Difference in Opinion as to Adequacy of Shop Instruction. Of every four men in the printing trades reporting, three say skill in the trade processes can be acquired thoroughly in the shop, while the fourth is of the contrary opinion. For the building trades only one of every three reporting answers in the affirmative and the remaining two in the negative. In the case of the metal trades, two out of every five reporting answer in the affirmative, the remainder in the negative. It must be emphasized that these answers do not refer to either general education or knowledge related to the trade.

Richmond Workers Come from the Elementary Schools. About one-half of these workers left school at the age of 14 or younger. Ninety-two of every 100 of them left school before reaching the age of 18. Contrary to the usual impression those in the printing trades withdrew from the schools at an earlier age than those in either the building or metal trades. However, the tendency in late years in all the above trades is to remain in school longer. This is shown by the fact that out of 54 apprentices reporting, only three had

entered employment under 13 years of age, and only 12 under 14 years of age, while 36 did so between 14 and 16 years of age. Practically none of these workers had received any high school training, and most of them much less than a complete grammar school training.

The Typical Richmond Worker Has Had Less Than Seven Years of Schooling. Out of every 100 of these workers, five had attended school three years or less, while eighty had received not over seven years of any sort of school training. Only six workers out of 509 had received as much as 11 years of schooling and none more than that. Much of this school attendance was in ungraded classes in rural districts. The amount of schooling of the workers in the printing, building, and metal trades of Richmond is practically the same

Lack of School Training Hampers Progress of Workers. Sixty out of every hundred of these workers reported that because of lack of schooling they were hampered in becoming efficient in their several trades. All workers having three years or less of schooling said they had been handicapped. More than 62 out of every hundred of those who had received seven years or less of instruction so declared. Out of 54 apprentices reporting, twenty-two said they had been held back in their work by insufficient education. Of these, 18 had attended school not more than seven years.

Many Workers Have Taken Courses Since Leaving the Regular Schools. Out of every 100 of these workers, 37 had tried to improve their economic condition by securing schooling after they became wage-earners. Six of every ten apprentices reporting had taken additional courses. Seventy-four out of every 100 of those student workers took courses in night school and 22 in correspondence classes, while four attended day school. Sixty-eight took courses bearing upon their trades for every 32 who took work unrelated to their occupations. Out of 509 workers reporting, 135 said they had paid tuition for instruction either in day, evening, or correspondence courses, since going to work. The total amount paid was $5,465.05, of which $3,176.80 was spent by 52 students in correspondence schools; an average of $61.09 per student; the largest sum paid by any student was $340.

Other Benefits of Schooling Greater Than the Financial One. Four out of every ten workers answering the question as to whether they had received an increase in wages as the result of taking courses answered yes, the remaining six answering

no. Nine out of every ten workers answering the question as to whether they had received benefit other than an increase of wage replied in the affirmative and only one in the negative.

Wages in the Building Trades Highest. Out of every one hundred of the workers in the groups selected, 11 earned under $10 per week, 10 from $10 to $15, 67 earned from $15 to $25, and 11 earned $25 or more. The wages in the building trades range slightly higher than in the printing and metal trades in which they are about the same.

Workers Ask for Certain Courses. Approximately 50 subjects for evening or part-time school instruction were suggested by these workers to help them in their present occupations. These requests come from both apprentices and journeymen. These subjects range all the way from such elementary school work as reading, writing, spelling, and arithmetic and such regular high school work as algebra, geometry, and physics to such practical work as shop mathematics, mechanical drawing, plumbing and steam-fitting, and gas engineering. About three out of every five subjects suggested were very practical courses helpful to the worker's employment. In the printing trades the characteristic demand was for trade chemistry, design, color harmony, and ink mixing. In addition, there was a pronounced demand for English and composition. In the building trades the characteristic demand was for mechanical drawing, architectural drawing, shop mathematics, and estimating. In the metal trades the characteristic demand in much larger proportion was for shop mathematics, mechanical drawing, and arithmetic.

FINDINGS BASED ON THE ESTABLISHMENT SCHEDULES SECURED FROM EMPLOYERS

The employers schedules cover the following important points not dealt with in the individual schedules:—

Products of the different establishments represented.

Busy and slack season of the various trades.

Difficulties in securing competent workers in specific occupations, with the reasons.

Period of maximum productivity in various occupations.

Years of experience necessary to minimum wage.

Probable increase and decrease in the demand for workers.

Relative demand and supply for skilled and unskilled labor.

Frequency and line of promotion from occupation to occupation in use.

Shifting of workers from process to process to give wider experience and training.

Opportunities for untrained beginners in specific occupations.

Relative efficiency of foreign and domestic trained workers.

Relative instability of employment of trained and untrained workers.

Conditions affecting the welfare of the worker.

Character of instruction received by workers in the shop.

Relative advantages of indentured and unindentured apprenticeship.

Character of apprenticeship agreements.

Relation of general school training to efficiency.

Extent of the educational deficiencies of beginners.

Types of schools and kind of training necessary to increase the efficiency of workers.

Willingness of employers to co-operate in part-time schooling.

Kind of part-time and evening schooling favored.

Practical tests used in determining the efficiency of applicants and workers.

Willingness of employers to make the shop experience of young workers more educative.

Field Covered by Schedules. In printing, 50 shops with 1,244 workers, covering practically the entire field. In metal trades, 17 shops with 4,924 people. In building trades, 20 concerns with 875 people.

Size of Establishments Covered. Printing trades, 31 out of 50 employ 20 people or less; remainder 31 to 110. Metal trades, 9 out of 16, employ under 100; remainder 100 to 1,000. Building trades from three to 100, the average per concern being 43.

Seasonal Fluctuations Are Smallest in the Printing Trades, the difference between maximum and minimum number employed being only 12 per cent. There is almost steady employment in railroad shops. General machine shops and foundries lay off about one-third of their workers employed in the busy part of the year. Rolling mills and ornamental iron works are affected more than the others of these three groups, being compelled to reduce working force by almost one-half in dull seasons. The building trades are affected more by seasonal fluctuations than any other of the trades mentioned.

Supply of Efficient Journeymen Reported Inadequate. Employers almost unanimously maintain that the supply of efficient journeymen in all the groups of trades mentioned is inadequate.

Larger Demand for Skilled Workers in the Near Future. Most of the employers, but particularly those in the metal trades, say that there will soon be a greatly increased demand for skilled workers in Richmond.

Chances of Promotion Are Slight. In the metal and building trades employers say chances of promotion from one occupation to another are slight. Where an affirmative answer was received, the statement was invariably made that the specific occupation open to promotion was that of foreman. All these trade groups suggest of course the promotion from apprentice to journeymanship.

The Amount of Systematic Instruction Given in the Shops is Apparently Small. If given at all it is given by the foreman alone who is of course burdened with many other responsibilities. In most of the trades, beginners other than apprentices are used only in unskilled work. In spite of the fact that practically none of the metal, building, or printing trades can be learned properly without systematic instruction, the number of apprentices reported is small.

The Amount of Apprenticeship is Small. Most apprenticeship agreements when made are verbal. Few employers indenture their apprentices in any of the trades. No regular apprenticeship system exists in the metal trades, only three firms out of 16 reporting any. Written agreements for apprenticeship exist only in trades well organized and the terms are usually regulated by the union. Conditions similar to those in the building trades are found in the printing trades.

The Period of Apprenticeship Varies for the Different Trades. Where agreements are reported, the period of apprenticeship for the printing trades is most frequently given as five years, for the building and metal trades as four. An automatic upward sliding scale of wages is provided for the apprentice in all these trades where written agreements are in force.

Employers, on the Whole, Report Conditions under Which Work is Performed as Causing No Particular Strain to the Workers. Some of those in the building trades, chiefly contractors and builders, mention lead poisoning in the painting trades and tuberculosis in the stone-cutting trades. In the metal trades,

the rolling mill and ornamental iron establishments say that sudden changes in temperature usually associated with their work might possibly affect the physical and nervous condition of their employees. Only two of the 50 firms representing the printing trades mentioned any conditions that might affect the health of the workers, these being found in the bronzing and photo-engraving departments.

The Lack of General Schooling Reported as a Handicap of Workers in All Trades. This is particularly true of printing. In the metal and building trades, employers report in addition the great need of a better knowledge of shop mathematics and drawing. When asked specifically what the schools should do for the worker before he enters the shop, the almost invariable answer of all employers was that they should give him more general education.

Distribution of Workers among Occupations within Trades. Out of every 100 workers in the various trades of building, there are:

26 carpenters	7 housefinishers
13 plasterers	6 tinners and sheet metal workers
10 bricklayers	
9 millworkers in wood	4 plumbers
8 cabinetmakers	4 wood finishers

the remaining 22 being distributed among 16 other occupations, making a total of 25 occupations found in the building trades. The proportion of apprentices is five out of every 100 workers. Out of 100 in the metal trades there are:

23 machinists	15 blacksmiths
12 molders	3 stove erecters and mounters
7 boiler makers	2 pipe fitters
6 rolling mill hands	1 patternmaker
1 nickel plater and finisher	

the remaining 16 being distributed among eight occupations, making a total of 17 occupations in the metal trades. Out of every 100 workers in the printing trades there are:

18 bookbinders	7 unclassified workers
12 press feeders	4 linotype operators
11 hand typographers	3 paper cutters
7 cylinder and platen pressmen	2 proof readers

the remaining 36 being distributed among 21 other occupations, making a total of 29 occupations in the printing trades.

Apprenticeship Most Extensive in the Metal Trades. Three hundred and twenty-six "apprentices and young learners" were reported by the firms returning schedules, distributed among the trades as follows:—223 in the metal, 62 in the printing, 41 in the building trades. Out of every 100 workers employed in the metal trades, eight were apprentices and young learners. In the printing trades and in the building trades there were five in each 100.

Subjects Needing to be Taught for the Various Trade Groups. In printing, employers emphasize the following in the order given:—English, arithmetic, punctuation, to be supplemented by courses in design, drawing, history of printing, chemistry, color harmony, color mixing, and physics. The suggestions made for courses for workers in the metal trades are chiefly of a strictly vocational character, such as "steps of the trade," "whys of the trade," "theory of the trade," in addition to mathematics, free hand and mechanical drawing, chemistry, physics, and in some instances metallurgy. In the building trades the suggestions vary according to the particular line of work done by the employer. The leading suggestions are shop mathematics, drawing, and blue print reading, adapted to specific trades or occupations, such as plumbing or carpenter work. Subjects proposed for painters are color harmony, design, modeling, letter writing, and the chemistry of the trade. Only one employer in the building trades suggested that general education be given.

Courses Suggested for Evening Classes for Journeymen. In printing, employers gave the following in the order of their frequency:—English, design, drawing, history of the trade, estimating costs, arithmetic, color harmony, chemistry of the trade. For the metal trades:—Mathematics and drawing, mechanical designing, electrical mechanics and estimating, fundamentals of the trade, and general education. Seventeen out of 20 employers in the building trades suggest free hand drawing and mechanical or architectural drawing; eleven, shop mathematics; four, chiefly painters and decorators, color harmony, paint mixing, chemistry of the trade, modeling, designing and lettering; and four mention general education.

Most Employers Favor Evening in Preference to Part Time Industrial Schools for apprentices. Sixteen out of 20 firms in the building trades, eight out of 16 in the metal trades, and a considerable majority in the printing trades so reported.

Many Firms Report a Willingness to Co-operate with Part-Time Day Schools for Their Workers. The question was asked

as to whether the employer would be willing to enter into an agreement providing for a definite period of attendance of apprentices at a part-time day school for a definite number of hours and pay them the usual wage while in school. Twenty-four out of 50 firms in the printing trades answered in the affirmative, as did five out of 16 in the metal trades, and a majority of the establishments who employ apprentices. The usual suggestion as to the number of hours per week to be given to part-time schools is from 6 to 8, usually in two-hour periods per day.

No Written Records of Individual Efficiency of Workers Are Reported as being used in any of the shops. No entrance tests of the worth of applicants for positions are used except "actual trial on the job."

Most of the Employers Report a Willingness to Co-operate with the Schools by Organizing the Shop Practice for the better training of workers. In answer to the question as to whether they would be willing to co-operate with the schools in an effort to organize shop practice so as to develop interest and efficiency on the part of the worker, 15 out of 20 firms in the building trades, 13 out of 16 in the metal trades, and 24 out of 50 in the printing trades answered in the affirmative.

FINDINGS ABOUT THE TOBACCO INDUSTRY

Size and Importance of the Industry. The tobacco industry is the largest industry employing women in the city of Richmond. There are relatively few workers under 16 years of age employed. Many of the workers are native born Americans and country bred. They compare favorably in general intelligence and health with operatives in other factory industries. Younger workers are mostly city children, some of them working in the factory during the summer and going to school in the winter.

Not a Skilled Industry. The industry is made up of a number of semi-skilled and unskilled operations which can be learned in periods ranging from two or three days to six or eight weeks. There is, therefore, no apprenticeship for women in the industry. This is also true of men except in a few shops where cigars are made by hand. Except for inability to do an average amount of work, girls can learn the operations in a very short time.

Wages. Much of the work is done as piece work, which naturally makes the earnings variable. Some of the shops pay on an hourly basis. This study has not as yet attempted to go into the actual earnings in detail.

Hours. The hours for work are 8½ to 9½ hours per day and 5½ hours on Saturday, making a total of 48 to 52 hours per week.

Work Not Seasonal. The work is practically constant, there being no rush except for the Christmas trade and no period without work, as stock is accumulated during the time when merchants make less demand upon the factories' output.

Overtime and Nonemployment. Overtime is rare; "lay offs" are unusual, though in a few cases brief vacations are voluntarily taken in the summer because of the heat. Little time is lost through illness and accident, machinery for the most part is reported as of the non-dangerous type and sufficiently guarded to insure saftety. In some of the factories a doctor inspects against illness and infectious disease.

Shifting of Workers. The study shows some shifting of workers, but with few exceptions the shifting is from factory to factory within the industry and not from one trade to another. Shifting seems to be due to the quality of the skill—the less skilled workers finding their way into the less skilled operations and vice versa.

No Recognized Line of Promotion within the Industry. Operations in the tobacco industry vary little in their demands upon general intelligence and skill, the two exceptions to the general rule being rolling and packing. Since packing is largely a matter of color sense, which is inherent rather than acquired, the opportunities for promotion are few.

Education of Tobacco Workers. The education of women in the tobacco industry is, except for very few workers, a little below grammar grade, the amount and quality being difficult to measure because of country schooling which lacked uniformity and standardization. Little illiteracy is found among white workers, except among the older women who went to work when rural schools were scattered and few in number and child labor the accepted custom.

Extra Schooling of the Tobacco Workers. Although it is difficult to obtain complete data upon the extra schooling of the entire body of tobacco workers, records from the Night High School show 98 women in attendance in the past year,

fully 75 per cent of whom were taking commercial courses, the remainder being students in the general academic and household arts departments. Workers themselves reported that general education was not demanded by their work in the industry, though many expressed a desire for academic subjects which would broaden their minds and advance their social standing.

Training Tobacco Operatives Not a School Problem. All operations in the tobacco industry are learned in the factory. The amount of specific trade information and technical training demanded of the worker is too meager to warrant the establishment of classes for their training in the public schools.

Workers engaged in the industry need and desire additional education, some along the lines of general education, others in cooking, sewing, and household management. The forewomen and so called "teachers," whose duty it is to look after the efficiency of the departments, need some training in industrial relationships. Their ideas about what they need in this direction are rather unformed.

The industry sees to it that its workers produce the standard quality and quantity of product; it does not concern itself however, with any form of general or specific education that contributes to raising the standard and efficiency of their workers.

What the Schools Can Do for the Tobacco Workers. No direct vocational training can be given tobacco workers in schools, and, owing to the specialized type of factory organization and division of labor, part-time instruction is practically out of the question. Night classes, however, can and should provide:

1. General education for workers who desire to extend their academic training
2. Household arts courses, carefully planned so as to insure effective practical training
3. Recreational and physically reactive gymnastics, folk dancing, etc., designed to meet the needs of women engaged in montonous and restricted occupations

Of these the last is of greatest importance for the tobacco worker. Her work is debilitating because it is monotonous, hence to keep herself in the best condition she must have proper physical training and recreation. This will make her a more efficient worker.

FINDINGS ABOUT THE DEPARTMENT STORES

(These were not sufficiently completed to report in this synopsis, but will appear in the final report.)

The findings about the department stores, when completed, will cover the following points:—

1. Number of department stores, rank, and size
2. Methods used in making the Survey
   a. Schedules—individual and employers'
   b. Classification of occupations
3. Analysis of occupations with chart on industrial and educational findings
4. Status of workers, education, age, and nativity
5. How department store workers get their training
6. Conditions in the work that affect health of workers
7. Employment
   a. Regular hours
   b. Overtime
   c. Nonemployment or "lay offs"
8. Wages and promotion
9. What the schools can do for department store workers in the
   a. Day school
   b. Night school
   c. In part-time classes

APPENDIX SHOWING A TYPE ANALYSIS

PAINTING

Processes. The painter performs a variety of operations, some of which are only indirectly or remotely related to the work of laying on coats of oil paint, varnish, water color, stain, or kalsomine. These operations may be characterized briefly as follows:—Preparation of wood, plaster, and metal surfaces to receive the finishing coats; removal of old finishes; preparation and mixing of spirit or oil vehicles, and lead, zinc, and color pigments; rubbing down coats; and in certain classes of work, graining, laying gold leaf, gilding, lettering, free hand drawing, stenciling, rigging scaffolds, and setting glass with putty or mouldings in windows, doors, and skylights, constructed of wood, metal, or stone. These processes, which must be performed under a variety of conditions—in the paint shop, in manufacturing plants of miscellaneous character, or on the outside or inside of dwellings or other buildings—can best be considered with reference to each of the several classes of work which the all-round painter must be prepared to undertake.

House Painting. House painters may be divided into two classes, namely: brush hands, who do only rough outside work, and whose only trade qualification is ability to cover extensive surfaces; and skilled artisans, who understand the mixing of paints, and can do any sort of inside or outside work.

The first step in house painting, as in other painting, is preparation of the surface to be covered. In new work this consists in cleaning and smoothing the surface with sandpaper and duster. In old work the first step is removal of old finishing coats of paint or varnish, which is commonly done by burning with a Bunsen burner and scraping, or by applying paint or varnish solvents and scraping. Surfaces from which old finishes have been removed must then be sandpapered until perfectly smooth. When the wood has been laid bare, smoothed, and cleaned, it is ready for the priming coat of white lead, ochre, or other pigments mixed with linseed oil to the proper consistency. The color is

selected for the priming coat with reference to the color of the coats that are to follow.

The priming coat is worked well into cracks and nail holes to protect these broken surfaces and is allowed to dry, after which cracks and holes are filled with putty, which adheres well to the paint. Two or more coats of the required color are now applied, the number and composition of the final coats depending upon the class of work.

Staining, Filling, and Varnishing. Dyes dissolved in water, oil, or spirit are applied to the bare wood to give color and to bring out the grain. Another method of staining is that of exposing the surface to ammonia fumes in a closed receptacle, the fumes by chemical action turning the wood nut brown.

The pores of the natural or stained wood are filled with a liquid or paste filler, liquid fillers being used on close-grained woods such as pine, and on large surfaces; paste fillers on coarse-grained woods such as oak or chestnut. A coat of filler is applied evenly, allowed to stand twenty-four hours, and then sandpapered lightly. On fine cabinet work in close grained wood white shellac is often used as a filler, since shellac makes a good foundation and does not darken the wood as does varnish. Paste fillers, the best of which are made of ground rock crystal mixed with raw linseed oil, japan, turpentine, and some color suitable for the wood, are applied to the surface, worked into the pores and left in a thin layer on the wood. When the filler has become dull and chalkish it is rubbed off at once, rubbing first across the grain to fill the pores thoroughly and then with the grain to bring out the high lights. Twenty-four hours are then allowed for the filler to harden. One application is usually sufficient, but two are sometimes necessary.

Copal or oil varnish is usually flowed on, the brush being dipped deeply and flowed on in a heavy coat. The surface is then gone over lightly with the brush as free from varnish as possible until the work is left with only a thin coating. Three or four coats are generally applied, allowing time after each coat for drying. The first coats are rubbed with hair cloth or curled hair. For a dull finish the last coat is rubbed until smooth with powdered pumice stone and water, and the pumice removed with a damp sponge and chamois skin. When a gloss finish is desired the last coat is not rubbed. For a polished finish the last coat is rubbed with pumice stone and water, then with water and rottenstone, and, if a very fine surface is desired, it is finished with oil and a little rotten-stone rubbed with a soft flannel or even with the bare hand.

Shellac or spirit varnish, made by dissolving shellac in alcohol, does not flow freely. It must be applied thin, with long even strokes of the brush. A surface finished with shellac varnish is given five or six coats, each coat being rubbed down with fine steel wool, curled hair, or oiled sand-paper.

These processes are performed in the order in which they have been described, the stain being applied first, then the pores of the wood being closed with filler, and last the varnish coats being put on according to the finish desired.

Kalsomining. In kalsomining the first process is that of cleaning and preparing the walls. All grease or lime spots are scraped and smoothed, and all nail holes and cracks filled with a putty or whiting or plaster of paris. The walls are then given a sizing of thin glue, which causes the kalsomine to hold well to the wall, and at the same time prevents it from striking in. Sometimes a coat of oil paint or hard oil is used for this purpose, and also to prevent dampness from striking through the walls and discoloring the kalsomine.

Kalsomining mixture, which consists of dissolved glue, whiting to give body, and some coloring material, such as is used in oil painting, to give the desired color, must be prepared with reference to the work to be done, more glue being required, for example, on side walls to prevent rubbing, than is required on ceilings.

In fresco painting the kalsomine is applied while the wall is still damp, making the color a part of the fresco work, but in cases where the walls are not decorated they are allowed to become thoroughly dry before the kalsomine is applied.

Any desired color may be obtained by the mixing of the primary colors, red, yellow, and blue, lamp black being added in some cases. Kalsomine is applied with a large brush, working the ceiling first and then the side walls.

Sign Painting. Sign painting, which includes all kinds of advertising painting, from small lettered signs on cardboard or wood to large pictorial work on walls and large sign boards, requires on the part of the painter a special aptitude for fine color work, designing, free hand drawing, and lettering. Some classes of work are done in the shop, but much of the work must be done away from the shop.

In small lettered signs the ground is prepared by laying on several coats, usually of white paint consisting of white lead mixed with equal parts of turpentine and oil. When

these coats have dried thoroughly, the letters are sketched off with white chalk, and are then carefully traced with charcoal. The surface is then brushed over, leaving only a dim lay-out, and the letters cut in, by outlining with lamp black mixed with linseed oil, using for fine work a small red sable pencil brush, and for large work a small bristle brush. When the surface to be lettered is of metal it is first pickled with vinegar, in order to make the paint hold well, the other processes being the same as in the case of wooden surfaces.

The letters are now filled in with paint—black paint being most commonly used on a white background—or are further prepared for gold leaf.

In gold leaf work the letters are coated over with a good oil gold size which is allowed to stand usually about twenty-four hours until it has reached that degree of dryness which is called "tacky," in which state the gold leaf will adhere to it strongly. The gold leaf is now applied, as much of a leaf being uncovered as is necessary to go on a certain part of the letter, and then cut by running the finger nail across it. Then, without removing the leaf from the book and keeping the rest of the leaf covered, the portion cut is pressed firmly against the size on the part of the letter to be covered. The gold leaf adheres to the size when the book is withdrawn. When all of the letters have been covered in this manner, they are cut in with a size made of fat oil, lamp black, and a little white lead. Generally, to complete the work, the sign is laid in a horizontal position and smalts of ground black glass are sifted on. When the size has dried enough to retain the smalts the sign is raised to a vertical position, and the superfluous smalts are brushed off with a soft brush.

In sign painting where there are several signs of the same kind to be made, stencils are used. The letters or design are first drawn on a sheet of stiff heavy paper and then carefully cut out. The sheet of paper is tacked to a light wooden frame and well coated with shellac. Where the sign is to be made in two or more colors, several stencils are made, one for each color. After the sign has had two coats of ground color and has thoroughly dried, the stencil is laid upon the sign and the paint applied through the opening cut in the stencil. The paint used is mixed with benzine and is applied with a stiff bristle brush. After the letters are dry they are all second-coated without the use of the stencil.

Gold Lettering on Glass. In gold lettering on glass the letters are first outlined with chalk on the outside of the glass. They are then covered on the inside with a size made by

placing in cold water Russian gelatine, sometimes called Russian isinglass, and boiling for about three minutes. The size will become "tacky" in from fifteen minutes to three hours. The gold leaf is then put on by handling it with what is called a "tip," which is a brush consisting of a thin layer of camels hair glued between two pieces of cardboard. The hair of the tip should be slightly oily, so that the gold leaf will adhere to it until placed against the size on the letter. After the gold leaf is placed on the letters, the chalk lines which show through the gold are carefully outlined on the inside with black paint. When this paint is dry the gold leaf which projects beyond the lines is removed with a piece of cotton and water. The letters are usually outlined with paint in such a manner as to give them the appearance of thickness. After this work is dry the whole is given a coat of varnish.

Graining. In imitating the grain of various woods the surface is first given at least two coats of paint tinted according to the kind of wood to be imitated. The second coat of ground color is made to dry with a gloss, so that the graining mixture will not, by being absorbed, make the grain appear dingy. After the ground color is thoroughly dry, the graining mixture, of a color to suit the kind of wood to be imitated, is applied and before drying the coarse grain is made by drawing a graining comb of leather or gutta percha over the surface. The surface is then worked over with a fine steel graining comb in the same direction. The heavier figures of the grain are made by wiping out the graining mixture with the thumb covered by a piece of cloth. A fine bristle brush is finally passed lightly over the surface to blend or soften the heavy lines, imitating as nearly as possible the grain of the natural wood.

Railroad-Car Painting. In Richmond railway-car painting constitutes a branch of the trade of sufficient importance to warrant separate treatment.

Car painting is classified under two distinct heads, i. e., passenger car and freight car painting. Passenger car painting is a very high grade of work, requiring much experience and skill in all the processes of painting, varnishing, and finishing, while freight car work can be done by any ordinary painter, since no special skill is required for this work of painting of freight car bodies and trucks.

Passenger car painting may be sub-divided as follows:—Exterior painting of new cars, interior finishing, and refinishing of old cars.

New cars when brought into the shop are first rubbed down with coarse and then with fine sandpaper. After this is done the wood filler is applied, the filler being a pigment mixed with oil and turpentine to the consistency of a thick cream.

After the coat of filler come three coats of body color, each one being rubbed down with pumice stone and water. The exterior decorations, such as lettering and striping, are then applied, and the entire car revarnished.

In interior finishing the new interior woodwork is rubbed down with sandpaper and a coat of clear shellac applied. This forms a foundation for the three coats of varnish which follow. The interior varnish coats are each smoothed by rubbing with pulverized pumice stone and water.

The first process in refinishing old cars is the removal of all old paint by heating it with the flames from a Bunsen burner, gasoline being mostly used for this purpose. This having been done the entire car is rescraped, scrubbed down with water, and sandpapered. Wood filler is not applied to old work, as the pores of the wood are already filled. Each body coat is rubbed down with pumice and water and the decorations and varnish applied, as in the case of new cars.

It requires about six days to paint a car completely, much of this time being of course consumed in allowing the several coats of paint and varnish to dry.

All window and door glass is put in in the car shop, although this work does not come directly under the supervision of the foreman of the paint shop, and is not done by the car painters.

With the introduction of steel cars by railway companies, a new method of applying paint has been found. This method consists of spraying paint upon the surface with a spraying machine. At the present writing this method has not been introduced in Richmond, all of the paint being applied by hand.

The steel car painting done in Richmond is all repainting and refinishing. The car is given five or six coats of a body color, each coat being rubbed down with pumice, and then decorated and varnished.

Freight car and truck painting requires no special comment, as this is the most common form of painting done in the car shop and does not differ from other rough painting.

Product or Specialties. The work of the painter in Richmond is not materially different from that done by painters in other communities, although railway-car painting may be designated as a line of work employing a considerable number of men. In general the work of the trade embraces inside

and outside painting of buildings; decorating; sign painting; painting of wagons, carriages, automobiles, steam and street railway coaches; painting of bridges, tanks, and structural iron work; of agricultural implements, and of furniture.

Importance of the Trade. According to the Federal Census of 1910, there were in Richmond in that year 543 painters, glaziers, and varnishers, of whom 447 were employed in the building trades and 96 in factories. Of the painters in the building trades, 421 were white and 26 were colored. The number of painters in the city at the present time is estimated to be approximately 600.

Conditions of Employment. The work of the painter is not generally such as involves any peculiar physical or nervous strain beyond that involved in any sort of manual labor. Moreover, the work of the all-round well trained painter is sufficiently varied to stimulate interest, much of it requiring the exercise of high-grade skill and of artistic sense. In some Richmond shops, however, the work is to a very considerable extent specialized, one man doing the rough work of burning and scraping off old finish, sandpapering and putting on body coats, another filling, staining, and varnishing, and another striping and lettering. In house painting, also, one set of men may be employed entirely on rough work. For the relatively unskilled men who are kept on the rough work, there is comparatively little in the occupation that is stimulative, although there is in some cases a chance of promotion to the finer work of inside painting and decorating, sign painting, lettering, and finishing. In some classes of work there is danger of accident from imperfect construction or rigging of scaffolds.

Hygiene of the Occupation. The condition of employment which most seriously involves the welfare of the painter is that which exposes him to the danger of poisoning. It has been scientifically demonstrated that many of the materials with which the painter works are poisonous, and it is true that many of the processes are such that it is difficult, especially under certain conditions, to avoid infection. There are, however, certain simple precautions by which much of the danger can be avoided. A brief summary of the findings of scientific investigations and of the present survey as regards the hygiene of the trade follows. In general it may be said that the returns on the schedules of the survey, and the information gathered in personal conferences with painters, is entirely consistent with the findings of scientific research as regards the injurious effects which follow the use of certain

materials, and which result from carelessness or improper procedure in various lines of work.*

Either or both the pigment and the vehicle of paint may be poisonous and either or both may be perfectly harmless. The higher priced paint usually contains white lead, linseed oil, and trupentine. Both the white lead and the turpentine are poisonous. The pigment in cheap paint may be something perfectly harmless, as chalk or barytes, while the vehicle may contain so great a percentage of petroleum compounds that it is extremely poisonous especially when used on inside work in enclosures poorly ventilated.

The pigments which cause poisoning are the lead salts, white lead, or basic carbonate of lead, sublimed white lead or basic lead sulphate, chrome yellow or yellow chromate, chrome green (a mixture of chrome yellow with Prussian blue), red lead and orange mineral. Lead carbonate and lead sulphate are used in the higher priced paints, usually separately but sometimes together, and the carbonate much more commonly than the sulphate. Chrome yellow is used for tinting in house painting and in coach painting; chrome green for painting window shutters; red lead in painting structural iron work, and orange mineral for painting wagons.

Of these constituents lead carbonate is considered the most poisonous; but when sandpapering, mixing, or chipping off old paint, the red lead is the most dangerous because it is lighter and floats in the air more easily. Chrome yellow is considered to be about as harmful as the red led. Lead sulphate is not as dangerous as the lead carbonate, red lead, or the chrome yellow. It has been determined by scientific experiment: that in human gastric juice the lead carbonate is a little more than twice as soluble as the sulphate; that the lead carbonate is distinctly more toxic than the sulphate; that both produce acute lead poisoning.

Experiments conducted to determine the effect which milk, when combined with the gastric juice, has upon the amount of lead dissolved brought the conclusion that when the milk and gastric juice are in equal proportion the hydrochloric acid of the gastric juice is so completely fixed by the milk proteins, or neutralized by the carbonates in the milk, that the mixture has virtually no solvent action on the lead salts.

On the basis of scientific investigations three practical suggestions have been made for safeguarding painters against

*As regards the nature and physiological effects of paint and varnish poisons, the following text is largely summarized from Bulletin No. 120, U. S. Dept. of Labor, by A. J. Carlson and A. Woeful.

poisoning: (1) that since lead carbonate is so much more toxic than the lead sulphate, lead workers as well as the State shall aim at the elimination of the use of the carbonate in all the industries where this is possible; (2) that since basic lead sulphate, or sublimed lead, is poisonous, none of the precautions usually advocated for the protection of workers in lead be neglected by those handling lead sulphate; (3) that, in addition to taking other important prophylactic measures, workers in lead salts should drink a glass of milk between meals (say at 10 A. M. and 4 P. M.) in order to diminish the chances that the lead they have swallowed be dissolved by free hydrochloric acid of the gastric juice, as in some persons there is considerable secretion of gastric juice in the empty stomach.

Dust from the sandpapering of lead painted surfaces is one of the most important causes of lead poisoning. The dust thus raised is inhaled and lodges on the nasal and pharyngeal mucous membrane and is then swallowed. Investigation has shown that the great bulk of this dust finds its way into the stomach and not to the lungs. This causes the poisoning of the workman, as the lead in the dust is dissolved by the free hydrochloric acid in the gastric juice and is easily absorbed. This dust is dangerous not only to the man doing the sandpapering, but also to the others working near. The danger can be entirely eliminated by the use of pumice stone and water in rubbing down coats, or, if it is a first coat where this is apt to raise the grain or on metal where it may cause rust, by moistening the sandpaper with some cheap mineral oil. Sandpaper so oiled lasts as well as when used dry, and the results so far as the work is concerned are as good when oiled paper is used as in dry sandpapering.

When metal surfaces are to be repainted they are usually chipped clean, and often the work is done by a machine using compressed air. This work is very dangerous and a much better way, whether on wood or metal, is to burn the paint, causing it to curl and shrivel up after which it can be easily scraped off. Some authorities speak of lead poisoning being acquired by the use of the burning method; but this is not apt to happen unless the painter should hold the flame long in one place, and thus cause considerable smoke which might carry mechanically small particles of lead. The boiling point of lead is so high that the danger from evaporation from the heating required is very slight. Danger of poisoning from this method arises, however, when the burned paint is allowed to lie upon the floor of the shop until ground to dust. This dust is stirred up by the feet of the workmen or by moving materials, and is constantly inhaled and swallowed by the

workmen. The scraps of paint should in every instance be cleaned up before they become dry.

The painter should be extremely careful in handling his food or tobacco, and should avoid wearing dusty and paint-soaked clothing.

The dangerous vehicles are turpentine, benzine, naphtha, benzolo, wood alcohol and amyl acetate. Turpentine used as a dryer, and for thinning, is a constituent of many paints and varnishes. It sometimes makes up the entire vehicle. The inhaling of much turpentine-laden air causes headache, dizziness, and irritation of the throat and of the urinary system. If the workman is exposed for long periods to turpentine fumes it often causes chronic inflammation of the bladder and kidneys. These fumes cause also inflammation of the skin and often affect the nervous system, as is evident in the typical symptoms of staggering and in extreme cases loss of consciousness.

Benzine and naphtha are used in hard oils as dryers, and very often constitute a large percentage of the vehicle in cheap quick-drying paints. Fumes from these liquids affect the nervous system much as does alcohol, causing staggering, defects of memory, and disturbance of sight and of hearing. Where the workman is long exposed to these fumes, chronic poisoning takes place, causing skin diseases, weakness, nervousness, and sometimes even impaired mentality.

Benzole is used in priming and as a paint and varnish remover, because of its penetrating and solvent qualities. The benzole fumes are very dangerous and may be fatal. They cause changes in the blood, hemorrhages of the organs and mucous membranes, and degeneration of the organs. The symptoms of this poisoning are a flushed face, dizziness, and headache followed by a blue appearance of the skin, nervous excitement, or stupor accompanied by sickness. If the poisoning is chronic ulcers appear on the gums and lips.

Wood alcohol poisoning comes mostly from inhaling the fumes while using varnish. This causes headache, hoarseness, twitching of the muscles, weak heart, unconsciousness, and temporary or permanent impairment of sight even to the point of complete blindness.

Amyl acetate, derived from fusel oil and acetic acid, is used in varnishes, gilding fluids, and as a paint solvent. The fumes cause headache, uncertain movements, difficulty in breathing, sleepiness, bad heart action, and poor digestion.

Poisoning from the various paint vehicles may be avoided in most cases by insuring good ventilation either natural or artificial of shops or rooms where work is being done. When

this is not possible, the men should be changed as often as possible on work, so that no one of them will become enough poisoned for permanent injury.

Although the vehicles in the various leadless paints are usually much more poisonous than those used in lead paint, the introduction of these paints into the industry is a great help toward the betterment of hygienic conditions in the trade, as it is much easier to avoid poisoning from the vehicle than it is from the various lead pigments in the paint.

It may be noted that the paints used in railway-car painting are almost entirely the new leadless or almost leadless kind. The smoothing of all paint surfaces is done either by the use of pumice stone and water, or with oiled emery cloth or sandpaper. All paint is removed by burning and scraping, and the work is done in large open buildings where the ventilation is such that there is very little, if any, danger from the volatile substances in the paint. Railway-car painting in Richmond is, therefore, to a very large extent free from the dangers of poisoning above cited.

Economic Conditions. House and sign painters are to a very considerable extent free lances, working first for one contractor, and then for another, or independently on their own account. The character of the work done by them varies greatly from job to job, and partly because of the miscellaneous character of their work, and partly because of the nature of the climate in Richmond, employment is not markedly seasonal. The slack season is from the first of January to the end of February, and the men are employed on the average about ten months during the year. The sign painter, when weather does not permit outside work, usually has on hand work which can be done in the shop. As regards painters in the car shops and in manufacturing plants, employment is generally steady, and the seasonal fluctuations inconsiderable. Hours of labor range from 8 to 9 hours per day, or 48 to 54 hours per week, full time being worked on Saturdays. Skilled journeymen earn $3.00 per day, the minimum wage for unskilled labor being $1.50. Wages are low as compared with wages paid in other trades. The trade is about 10 per cent organized.

Age Period of Productivity. Boys enter the trade between the ages of 16 and 18 years, and serve a four years apprenticeship. The age period designated as the period of maximum productivity is from 22 to 55 years.

Demand for Labor. House painting is a field in which the demand for labor is increasing, but the occupation is, never-

theless, somewhat overcrowded, especially with semi-skilled workers. The demand for sign painters is increasing, and there is a scarcity of skilled high grade workmen. In the car shops and in manufacturing plants the demand for labor is fairly stationary. In general the supply of medium grade labor seems adequate for the present demand; the supply of high grade labor is insufficient to meet the increasing demand in special lines. Workers are recruited from the lower grammar grades and from casual labor.

Educational Trade and Technical Requirements. In the way of general education, the occupation of the painter makes no special demand upon the worker, beyond that degree of general education required for all workers to insure to them advancement in proportion as they acquire, in practice, trade and technical excellence.

The trade and technical knowledge required by the skilled artisan is, however, very considerable. The nature of this knowledge will be apparent from the foregoing account of the processes and hygiene of the occupation. Some trade knowledge pertains even to the simplest processes, as, for example, to the process of rubbing down surfaces, where sandpaper of a proper grade of fineness must be selected, or some other material, such as ground pumice stone, rotten stone, fine steel wool, or curled hair. The painter must know which of the many varieties of fillers, sizes, or foundations should be used on woods of different qualities, and in different classes of work. He must know something of the preservative qualities of different finishes. He must know how to mix oils, pigments and varnishes, for body coats, for flat and for glass finishes, for inside and for outside work. In all color work he must have a knowledge of color mixing and harmony.

The degree of manipulative skill required by the painter varies from the small amount required to lay on rough body coats to the very considerable amount required for flowing on varnishes, and for the fine work of striping, lettering, and decorating. The characteristic tool of the painter is the brush, which varies from the small round pencils and sash tools of camels hair, to the large, round or flat brushes of hog bristles. In the handling of these tools a very high degree of manipulative skill is required for certain classes of work. In all classes of work the skilled hand economizes time, labor and material.

In addition to the above qualifications, the painter should possess an accurate color sense; an artistic sense, which will enable him to harmonize colors in inside decorating, and to do original work in designing; a knowledge of alphabets for

lettering; and a natural talent and skill in free hand drawing. Finally it is vitally important that the painter shall have a thorough knowledge of the hygiene of his occupation.

What the Industry Gives. The workers in the skilled class enter the trade through an apprenticeship, usually of four years. During this four years the apprentice is occupied as follows. In the first year, he helps by running errands and cleaning brushes, and picks up such information as he can from observing the workmen; he learns to mix paints, and to rig scaffolds; he does inside and outside painting, and learns to remove stains by the use of lime and acids. In his second year, the apprentice is put on the scaffold, and works with the journeymen putting on finishing coats; he learns how to remove old finish by burning and scraping, or by the use of solvents, and how to prepare work for new finish. In his third year, the apprentice is put on inside work, such as graining and varnishing, and is in general allowed to do such work as he is able to do. During his fourth year, he is given such work as he has not already done, and by constant practice becomes more proficient in all lines of work. This apprenticeship gives the boy a small amount of trade knowledge, and enables him to acquire a fair degree of manipulative skill.

No provision is made in the shops for systematic instruction either of apprentices or of journeymen. The line of promotion is from apprentice to journeymen, and from journeymen to foremen. The skilled painter may go into business on his own account.

Deficiencies of Workman. The deficiency most commonly acknowledged by the painters is deficiency in the general education which they believe to be a condition of advancement in their trade. Nearly all painters have a very inadequate knowledge of the hygiene of their occupation. Few possess the trade knowledge necessary for estimating costs and qualities of material, and few possess an adequate knowledge of the principles of color mixing, color harmony, or design.

What the School Ought to Give. Before entering the shop the painter should have received in the public school a complete elementary general education, and prevocational training in drawing, design, and color harmony.

A serious obligation rests upon the school, as regards instruction of apprentices and journeymen in the shops. This obligation arises from the fact that a thorough knowledge of the hygiene of the occupation is absolutely essential as a safe-

guard against poisoning. Such instruction, it would seem, should take precedence over every other sort of continuation work. Assuming, however, that this instruction is given, the school may properly undertake to give instruction organized with reference to the technical requirements of the painter, by offering courses covering freehand drawing, lettering, design, color harmony, composition of paints, varnishes and other materials, and modern practice in special lines of work.

These courses may be grouped under the following heads. (See also outline of course for painters.)

1. Trade hygiene: Diseases and dangers of the trade
2. Art: Color harmony, freehand drawing, and design
3. Chemistry: Chemistry of color pigments
4. Mathematics: Estimating
5. Business practice: Methods of doing business; bookkeeping

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